



PUBLISHED EVERY FRIDAY
AT

33, TOIHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: VICTORIA 8836 (6 lines)

Annual subscription payable in advance and postage free:

British Isles and Abroad..... £2 5s. 0d.
Single Copies..... One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 60. No. 12.

FRIDAY, MARCH 23, 1934

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DIESEL RAILWAY TRACTION

A Supplement illustrating and describing developments in Diesel Railway Traction is presented with each copy of this week's issue.

Lord Faringdon

TO the railway industry generally and to the London & North Eastern Railway in particular the loss of Lord Faringdon, who died last Saturday, will be very great. His best known work for British railways was in connection with the Great Central, the Board of which he joined in 1894, the year after the extension to London had been authorised. He was mainly instrumental in raising the huge amount of capital necessary for that extension, and during his Chairmanship, which lasted from 1899 to 1922, he saw all causes of friction with the Metropolitan removed and secured friendly working arrangements with the Great Northern and the Great Eastern Companies. Another outstanding achievement of his Chairmanship was the construction of the great new dock at Immingham. When the London & North Eastern Railway Company was formed in 1923 he was able to hand over to it a really valuable property, which has been of increasing use to the larger undertaking. Since the amalgamation Lord Faringdon had guided and controlled the whole finance of the London & North Eastern Company. He had also large interests in Argentine railways, and though not himself a Director of any of them, his advice on questions of policy and finance was constantly sought and his influence

was far-reaching. An appreciation by Mr. William Whitelaw of Lord Faringdon's work for the L.N.E.R. is published on page 498.

* * * *

South Kenton Station

Although on several occasions we have urged the adoption of more attractive railway stations, modesty forbids us to take any credit for the bright little station at South Kenton, recently built by the L.M.S.R. as an admitted experiment; we merely express our warm approval and leave it at that. Here the South Kentonite may buy his ticket at a light wood and stainless-metal office; on the platform he is protected by a roof of sensible steel construction (but, oh! L.M.S.R., why archaic match-boarding to the soffits?); a glass and stainless metal kiosk provides his daily paper; and a round-ended waiting room interposes metal windows and cream coloured enamelled iron between him and the biting blast. Within are oaken chairs with backs, and an oak table inlet with a glass-protected time-table; gone is the gloomy fireplace, evicted by recessed radiators; a brown mottled dado, light tinted walling picked out in red, and white ceiling decorate a pleasant room. Throughout the station flush doors painted green, with shaped glazed panels and stainless metal handles; clear red-lettered indicating boards; and uniform light wood poster frames, complete a successful experiment in building brighter stations. Excelsior, L.M.S. and other R's.

* * * *

The Week's Traffics

Of the four group companies the Southern is the only one to show increases in all classes of traffic for the past week, though in every case there is an improvement in merchandise earnings. The total of merchandise earnings of the four companies for the 11 weeks of the year to date is £10,907,000, an increase of £1,380,500 or 14.41 per cent. Their total traffics for the same period amount to £29,201,000, an increase of £1,842,000 or 6.73 per cent. Liverpool Overhead and Mersey traffics continue to improve. The London Passenger Transport Board earned £515,600 last week, its total for the 37 weeks being £18,418,200. Belfast & County Down receipts for the past week showed a decrease of £152, but for the year to date they are £544 up. On the Great Northern the past week's traffics show an advance of £13,250.

	11th Week				Inc. or dec.	
	Pass	Sc.	Goods, Sc.	Coal, Sc.	Total	Year to date
	£	£	£	£	£	£ %
G.W.R.	.. + 4,000	.. + 9,000	.. - 1,000	.. + 12,000	.. + 257,000	.. + 6.46
L.M.S.R.	.. - 6,000	.. + 32,000	.. + 32,000	.. + 58,000	.. + 720,000	.. + 9.08
L.N.E.R.	.. + 23,000	.. + 26,000	.. + 49,000	.. + 741,000	.. + 5.60	
S.R.	.. + 4,000	.. + 2,000	.. + 5,000	.. + 11,000	.. + 124,000	.. + 3.57
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Railways and the Screen

We are reminded by our American contemporary, the *Railway Mechanical Engineer*, that "the first movie actress was a locomotive." In the earliest days of the bioscope, a favourite subject was the express train, hurling itself directly through the screen—or so it appeared—at the spectators in the front rows of the stalls, so that those who believed in the principles of safety first have been known to vacate their seats hurriedly. But the novelty has long since passed; and the day has now come in which the train is beginning to take its place as a definite screen attraction. That the railway as a setting has "box-office drawing power" is proved by the vogue of such a film as "Rome Express." And in many another film, while the novelist would be content to mention the departure of his heroine from a certain terminus, the movie director must show her, with all the scenic and

acoustic accompaniments of the terminus, actually starting away. These days of well-informed criticism also demand accuracy in presentation, which can be obtained only by the use in the studio of real railway plant, or by the co-operation of the railways themselves. But railway managements are not altogether without interest in this matter. The thundering express, as our contemporary claims, may "spell romance, going to places, doing things, excitement for the audience." But at the same time it encourages the railway travel habit by representing the train as the normal method of progress.

* * * *

Preliminary Railway Returns

Preliminary returns published this week by the Ministry of Transport relate to all railways in Great Britain except the Metropolitan, Metropolitan District, and Tube railways now included in the undertaking of the London Passenger Transport Board. The totals for Great Britain for 1933 are provisional, as the figures of some of the smaller companies have been estimated. Gross receipts from railway working in Great Britain are estimated for 1933 at £149,600,000, as against actual figures of £149,648,000 for 1932 and £163,140,000 for 1931. Expenditure, on the other hand, shows a continuous fall from £132,614,000 in 1931 to £125,228,000 in 1932, and to an estimate of £123,100,000 in 1933. Taking the four amalgamated companies together, apart from the others, they show total railway receipts of £158,496,724 in 1931, which dropped to £145,341,319 in 1932 and to £145,291,017 in 1933. Railway expenditure, on the other hand, was reduced from £128,602,471 in 1931 to £121,380,192 in 1932, and to £119,355,279 in 1933, with the result that though railway net receipts fell from £29,894,253 in 1931 to £23,961,127 in 1932, they rose again to £25,935,738 in 1933. Net revenues of the four companies together amounted in 1933 to £28,804,162, as against £26,425,192 in 1932 and £33,370,535 in 1931. The average rate of interest and dividend paid per cent. of capital receipts for all British railways was 2.76 in 1933, against 2.59 in 1932 and 3.16 in 1931.

* * * *

Visitors to the German State Railway

No fewer than 480 foreigners from 40 countries paid special visits of inspection to study various phases of the working of the German State Railway in 1933. Great Britain sent 45, France 35, Holland 20, Belgium 15, Italy 30, Poland 20, Sweden 30, Switzerland 40, Bulgaria 35, Roumania 20, Russia 25, Turkey 15, Japan 30, India 20 and China 15. All were interested in the same things, of course, but the workshop organisation, the construction of rolling stock and the running of the high-speed diesel railcars were generally the chief objects of study. The educational and welfare work of the Reichsbahn and the anti-unemployment measures also attracted a good deal of attention. A number of these foreign visitors spent some time working in certain branches of the railway administration to obtain first hand experience and, in return, German railway officers were afforded similar facilities abroad. Ten commissions from other countries also visited Germany to conduct inquiries. These interchanges and visits are of great value in promoting the development of railway working and technical knowledge, in addition to the effect they have in diminishing insular notions. The Germans have, of course, always made a practice of familiarising themselves with what other peoples were doing in every branch of science and art and have never failed to profit by what they have learnt in that way.

Acetylene Lighting for Signals

The use of dissolved acetylene for lighting purposes, on the system developed about twenty-five years ago by the Swedish engineer Dr. Gustav Dalén has become widespread for marine purposes; buoys, lightships and lighthouses have been equipped in large numbers in all parts of the world. In some countries, too, such as Sweden—where it was first tried in 1908 at Västeraås on the Stockholm-Bergslagen line—Norway and Denmark, this system of lighting has been adopted for railway signals, including train head and tail lamps. A large number of level crossing warning signals now also have the Dalén light. In Great Britain, where trials were carried out before the war, the acetylene system of signal lighting met with little favour, but it appears to be attracting attention again in France, where the State Railways have nearly 300 signals fitted, chiefly on the Granville line. The Midi has also used this system for its "banner," or "P.D." type automatic block signals, and the Nord applied it to its automatic semaphores on the Persan-Beaumont to Creil section. Both fixed and flashing lights can be produced by the acetylene system, but it is thought by some railway officers that the flashing lights are not suitable where fogs are frequent, making the time of visibility of a signal rather short. The light given by the acetylene lanterns is, however, excellent and resembles that given by electric colour light signals.

* * * *

The Cause of Rail Corrugations

A theory of the cause of rail corrugation was propounded to us recently by the chief engineer of an overseas railway. He had been specially observing conditions for some time past and had noticed that heavy rails, laid in to withstand future heavier axle loads, but meantime carrying the prevailing light loads, tended to corrugate. Further, he had found that unusually stiff rails, such as test lengths of certain special rails, which deflected less under load than ordinary rails, showed the same tendency. He therefore suggested that the critical factor of corrugation was to be found in the area of contact between wheel and rail. Although there are places where rail corrugation exists which could be accounted for by this theory alone, we call to mind the extraordinary increase of the phenomenon on certain American railways of recent years, to which we referred in our issue of November 24 last. While the exact conditions under which these have come about are not known to us, it may be that they have occurred on lines relaid with heavier and stiffer rails, the yielding under load of which is less than formerly, and the area of contact between wheel and rail consequently less.

* * * *

A Roaring Railway in India

The cause of rail corrugation suggested above certainly does not seem to cover every case. The Nairaingun-Dacca-Mymensingh metre gauge section of the Eastern Bengal Railway, some 80 or 90 miles in length, was until about 23 years ago laid with 41½ lb. flat-footed rails and the whole length had become corrugated, the three or four hours' journey being one continuous "roar." It was then relaid with secondhand broad gauge rails, the first 10 miles with bull-headed or double-headed rails weighing about 73 lb. on Denham & Olphert cast iron plates with cut-down broad gauge tie bars. The remainder was relaid with 72 lb. flat-footed rails on wooden sleepers, the original brick ballast being retained on both sections, but added to where necessary. Within a matter of months the relaid broad gauge rails on both sections were roaring

as violently as the old light rails. Now the old rails, though probably softer than the relaid ones, were corrugated in exactly the same way as the latter, so that there was no question of stiffness of rail in this instance, and, it may be remarked, the axle loading and working conditions, as well as the ballast, remained unchanged. This is probably a record for a virtually continuous length of roaring rails. The worst corrugations were in the form of large blisters and hollows alternating, the period being about 4 in. to 6 in., though there were miles with the ordinary smaller corrugations also, widening at intervals to the larger periods just mentioned.

* * * *

American Structural Steel

New steel specifications have been approved for publication recently by the American Society for Testing Materials, by a sub-committee under the chairmanship of Mr. A. W. Carpenter, Engineer of Bridges, New York Central RR. Steel for bridges is covered by specification No. A7-33T; steel for buildings by No. A9-33T; and steel for plate work by No. A10-33T. It is only in the last-mentioned category that the use of bessemer-acid steel is permitted, and then not in the case of plates over $\frac{3}{8}$ -in. thick which are liable to be subjected to punching. Steel for bridgework and buildings must now have a tensile strength of 26.8 to 32.2 tons per sq. in., instead of the low limits of 24.6 to 29.0 tons previously specified; the minimum percentage of extension permitted in an 8 in. length falls from 25 down to 21 per cent. proportionately as the tonnage rises between these limits, and the percentages are reduced by 3 per cent. in the case of steel for buildings. Yield point must not be less than one-half the tensile strength, and in no case less than 14.7 tons per sq. in. Plate steel is required to have a tensile strength of 24.6 to 29.0 tons per sq. in., and a minimum yield of 13.4 tons per sq. in. Provision is made for the full-size testing of eyebars for bridges, which must have a tensile strength of not less than 26.8 tons per sq. in., and give a minimum extension of 12 per cent. in 18 ft. Two tensile and two bend tests per cast of steel are now required, instead of one as previously.

* * * *

Rubber in Railway Engineering

The paper presented by Mr. Colin Macbeth at a meeting of the Institution of Locomotive Engineers on "The Application of Rubber in Railway Engineering" drew attention to the extraordinarily varied uses of rubber on railways. On coaches and locomotives alone the amount is already great and shows signs of increasing as time goes on. The author included in his paper a specification for a passenger coach on the L.M.S.R. This specification called for 313 items weighing in the aggregate 608 lb., made up largely of rubber, although metal and fabric also entered into the construction of a considerable number of them. From the specification it appeared that buffing and draw gear used 34.5 per cent. and suspension 24 per cent. of the total. About 17½ per cent. was incorporated in the bodywork, and the lighting system used 2,180 ft. of cable and 20 per cent. of the whole by weight. A considerable amount of rubber is used in the construction of passenger coaches in America with beneficial results, and the extension of such usage would, it was suggested, be probable and equally applicable to European countries. A surprising amount of rubber is used on some British railways for locomotives and tenders, the amount in some cases being in the neighbourhood of 150 lb. per locomotive. Some companies are, the author states, fitting rubber drawbar and buffer gears on locomotives, although they have not

standardised it on passenger cars. It has been shown that the riding comfort has been greatly improved and that breakage of parts has ceased since auxiliary rubber springs were adopted.

* * * *

Locomotives Making 11,000 Miles a Month

What is believed to be a record performance in the way of locomotive service has been achieved on the Chicago, Milwaukee, St. Paul & Pacific Railroad with 22 modern steam passenger locomotives purchased in 1930 and 1931. These engines have each averaged over 10,000 miles a month since being placed in service and four of them have averaged 11,848 miles a month, whilst one has actually covered 18,390 miles in a single 30-day period. Our American contemporary the *Railway Age* points out that the figures of maintenance cost for these locomotives are also of unusual interest. The records indicate a cost of 14.5 cents (7½d.) a mile for a proportion of the engines, which included one general shopping, and 12.7 cents (6½d.) a mile for the remainder of the engines which have not been in for heavy repairs. All the locomotives are of the 4-6-4 type with cylinders 26 in. x 28 in., coupled wheels 6 ft. 8 in., a total heating surface of 4,205 sq. ft., and 225 lb. per sq. in. boiler pressure. They were built by the Baldwin Locomotive Works and the first 14 were assigned to through passenger service between Chicago and Minneapolis, whilst the later ones were put to work on other sections radiating from these points. The average age of the first 14 locomotives on October 31, 1933, was 45 months, during which period they averaged 434,107 miles each, or 9,647 miles per locomotive per month. The average age of the last eight locomotives on October 31 was 24 months, during which period they averaged 259,584 miles each or 10,816 miles per locomotive per month.

* * * *

Out-of-Date Locomotive Repair Shops

Some pertinent remarks appeared in a paper read before the New England Railroad Club recently by Mr. John Roberts, Chief of Motive Power and Car Equipment, Canadian National Railways. He said he felt sure all mechanical officers would agree that, generally speaking, present day locomotive repair shops are not adequate to meet the needs of modern locomotives of increased size and power. The relationship of the locomotive shop to the locomotive itself is too closely allied to be ignored any longer, and a very cursory acquaintance with many shops compelled one to admit that both the shop itself and the practice followed in it had not kept pace with recent locomotive developments. Unfortunately, the mechanical section is too often looked upon as a "spending department," and those in charge of it find it difficult sometimes to get the necessary capital to keep the equipment up-to-date, with the result that a great many obsolete machine tools are still in operation and represent a definite loss to the company. The blame for this, it is stated, is to some extent attributable to those in charge of the shops, who are too prone to say, perhaps under pressure, that they can "get along for another year." Similarly, if one is to believe all that one reads in railway periodicals and trade journals, the machine tool builders ought rightly to share a part of the blame. They have not, in the past, kept pace with the requirements of locomotive shops, probably because of the relatively limited market for their products, although for what might be termed "standard" tools, such as lathes, milling machines and shapers, there is a fairly steady demand. In the automobile industry everything is different, for no sooner does a machine or tool become obsolete than it is replaced by the most efficient machine procurable.

Italian State Railways in 1932-33

NOTWITHSTANDING the most rigid economy exercised throughout the financial year 1932-33 by the administration of the Italian State Railways, the fall in receipts brought about by the decrease of 12.45 per cent. in the tonnage and of 3.68 per cent. in the number of passengers conveyed could not be entirely made good, and the balance sheet for that year closed with a deficit of 603.3 million lire (£10,055,000*). This figure includes the previous year's deficit of 197.8 million lire (£3,296,000). The length of line in operation shows a net increase of 10 km. through the opening of the S. Ninfa-Salemi line in Sicily and totalled 16,928 km. (10,521 miles), of which 2,091 km. (1,300 miles) were electrified, an increase of 58 km. (36 miles) in comparison with the preceding year. The electrified lines, though representing only 12.35 per cent. of the total length, handled 25 per cent. of the total traffic. Steam traction on these electrified lines would have necessitated the purchase of 630,000 tons of coal. The electrification programme now under way and expected to be completed by the end of 1936, except on the Salerno-Reggio di Calabria Section, covers 1,840.5 km. (1,143.9 miles) and comprises the following sections which will be operated on the alternating current 3-phase system, 3,600 volts, 16.7 cycles:—Bolzano-Trento and Bolzano-Merano (53.8 miles); Trofarello-Cuneo and Fossano-Ceva (69.8 miles); and Carmagnola-Ceva, Cuneo-Mondovì, Ovada-Asti, S. Giuseppe di Cairo-Alexandria; the Sulmona-Pescara section of 42.1 miles will be operated on the 3-phase system, 10,000 volts 45 cycles; and the following sections are to be operated on the direct current system, 3,000 volts:—Naples-Salerno, Torre Annunziata-Gragnano (40 miles); Rome-Florence (192.8 miles); Rome-Aversa, Campoleone-Nettuno, S. Marcellino-Gricignano (140.9 miles); 195.4 miles in the Trieste area; and Salerno-Reggio di Calabria (260.6 miles) which is to be completed in 1937. The electrification programme further comprises the transformation of the Rome-Prenestina-Avezzano line from 3-phase, 10,000 volts, 45 cycles into d.c. 3,000 volts, and that of the Prato-Pistoia-Bologna line from 3-phase, 3,600 volts, 16.7 cycles into d.c. current. The map attached to the administration report shows in green the sections already electrified. Some results for the years 1931-32 and 1932-33 are compared in the accompanying table:—

	1932-33		1931-32		Inc. or dec. in 1932-33	
	Million lire	£ in thousands	Million lire	£ in thousands	Million lire	£ in thousands
Passengers ..	1,145.8	19,097	1,218.3	20,305	-72.5	-1,208
Goods, g.v. ..	365.4	6,090	351.7	5,861	+13.7	+229
Goods, p.v. ..	1,438.8	23,980	1,721.1	28,685	-282.3	-4,705
Total receipts	3,144.9	52,415	3,616.8	60,280	-471.9	-7,865
Expenditure	3,748.2	62,470	3,814.6	63,577	-66.4	-1,107

It is interesting to note the increase in grande vitesse goods traffic which is mainly due to the express parcels service. The number of passenger tickets sold (excluding season tickets) in 1932-33 was 80,457,998, a decrease of 3.68 per cent. The percentage of tickets for the three classes was 1.70 first, 9.82 second and 88.48 third in 1932-33, the corresponding percentages for the previous year being respectively 1.77, 9.89, and 88.34. Passenger receipts in 1932-33 were 5.95 below those of 1931-32. The number of light accelerated trains with two carriages and a total weight of 60-70 tons has considerably increased. Another class of light accelerated trains but of heavier composition up to 16 axles has been running on certain main lines. A number of very fast trains was put into service, notably the Milan-Turin in 1 hr. 43 min., the Trieste-Mestre (Venice) which covers the distance in

2 hr. 4 min. On the Turin-Leghorn line also noteworthy speeds have been attained which reduce the time of transit to 5 hr. 36 min. These, of course, are in addition to the other notable accelerations recorded by us since they began to come into operation in 1931 with the extraordinary improvement of nearly 20 m.p.h. in the average speed of the fastest Milan-Venice trains. Passenger trains covered 95 million km., an increase of 14.17 per cent. The total goods tonnage handled was 40,712 tons, of which 5,128,295 tons were departmental. Goods trains covered 44.9 million km., and ton km. (including departmental) totalled 9,131,363,475.

The total expenditure of £62,470,000 included £50,050,000 of ordinary expenditure, the remainder being "complementary," "accessory," and outside the railway service. In the ordinary expenses are included £24,133,000 (against £25,583,000) for ordinary service wages and salaries, fuel for steam traction £3,601,000 (against £4,400,000), electric traction current £1,185,500 (against £1,139,000), maintenance of rolling stock £7,295,000 (against £8,068,300), and maintenance of lines and electric traction installations £3,020,000 (against £3,146,000). In the complementary expenditure of £2,550,000 are included £672,500 for extraordinary maintenance, £1,120,600 for rail renewals, and £1,569,000 for rolling stock renewals. The number of employees of all grades has been reduced from 144,906 to 138,858, the principal reductions being amongst the executive and commercial staff. Electric train kilometres totalled 26,435,792 in 1933, and steam train kilometres 112,018,208.

* At 60 lire to the £.

Railcars in France

APPROVAL was given on October 12, 1933, by the French Minister of Public Works to a railcar construction programme, providing for 260 vehicles, presented to him by the railways. In a comprehensive review of the railcar situation in France, *Le Revue Générale des Chemins de fer* outlines the four kinds of service to operate which the cars have been designed. Primarily their greatest value will be as substitutes for steam trains on lines of secondary importance. The majority of steam trains at present working such services make stops every 5 or 6 km., and their speed rarely exceeds 30-35 km.p.h. In very many instances only three trains run in each direction daily, and their times are dictated by other considerations than the convenience of passengers. The first train, which carries mails, usually leaves very early; the last runs late, because it is frequently also used to shift empty stock. Therefore, travellers using secondary lines usually have only two good trains a day, which may or may not connect with others, so that it is often impossible to make a return journey in a day between two centres on different secondary lines. The introduction of railcars will enable services and connections to be increased, and in some cases for through services to be introduced serving large towns on a main line.

Secondly, they will be used as substitutes for steam stopping trains on main lines, where such a service is at present meagre for reasons similar to the foregoing. Some of the French railways are also contemplating the substitution of express railcars of large seating capacity for poorly patronised fast steam services. Accommodation would be provided for 100-150 passengers and the service augmented, procuring increased receipts with the utmost economy. Entirely supplementary services are also to be provided by means of railcars: (a) cross-country and main-line services giving additional connections with fast trains, effecting a saving of time over those already obtaining with steam stopping trains; and (b) seasonal services for holiday and health resorts. They will be used also as a

means of attracting fresh traffic, by a general improvement in time and frequency of transit between important centres on all lines, both for passengers and goods. Some steps in this direction have already been taken by an increase of steam services, but at the cost of considerable expense. The railcar programme, however, will permit the improvement of services and considerable economy. A certain number of long-distance express services are provided for, notably Paris-Deauville, Paris-Lyons, Paris-Vichy, Strasbourg-Metz and Mulhouse, and Paris-Lille.

For services on secondary lines, the tendency is to group the railcars in dépôts, called *étoiles* (stars), for convenience in working and maintenance. These dépôts are centrally situated in the areas over which their cars work, hence the name "star." In future each dépôt will house cars all of the same type, with a consequent diminution in the stock of spares required. The next problem to be faced is that of providing parcels and goods services on lines entirely operated by railcars. In some cases it is proposed to retain a steam train for this purpose. The P.L.M. is experimenting with motor parcels vans, and the Nord, to begin with, will use loco-tractors. The whole problem is being tackled comprehensively but not precipitately, for the present programme is the outcome of two or three years of careful experimentation. Already the railcar services instituted during this preliminary period have attracted new traffic and promise substantial results in the future.

* * * *

The Steel Rail—Past, Present and Future

IT was but a couple of months ago that we referred in an editorial article to the important subject of the steel rail, which forms so substantial an item in the annual maintenance expenditure of the railways. Our previous reference arose from the mention, in a paper read before the Institute of Transport on "The Engineer in Transport," of the exceptional wearing capacity of the earliest steel rail. The matter of the rail has now, however, been brought to the fore in a far more comprehensive and detailed way in the paper entitled "Steel Rails" which was presented by Messrs. Edward Fulton Law and Vernon Harbord to the Institution of Civil Engineers on March 6 last. In their introduction the authors summarised their paper as intended to review the various developments which have taken place, both in the matter of alloy steels and heat treatment, to impart to the rail a resistance to abrasive wear which will increase at least *pari passu* with the increased severity of the abrading conditions, and of certain service troubles which have arisen in consequence. It was thus made clear, as we have often contended, that rail wearing capacity in general has remained stationary, even if it has not diminished, while the conditions of its service have become unceasingly more severe. Modern manufacturing conditions which have helped to produce this result—larger ingots, heavier mills, wash-heating, higher finishing temperatures, resulting in less work on the steel at lower temperatures and more decarburisation of the other surfaces—were reviewed, and it is pertinent to observe that all these developments have taken place at the expense of rail wear, but in the interests of the manufacturer, and yet without infringement of the provisions of the British Standard rail specification. On the other hand, had the manufacturer attempted to improve his product by, say, the increase in the percentage of manganese which the authors agreed as highly desirable, he would immediately find himself in conflict with the narrow limits of the specification analysis and tests. Consulting engineers, indeed, find a difficulty in recommending medium manganese rails to overseas customers while the B.S. specification still fails to recognise this quality and

limits manganese to a maximum of 0.8 per cent. There is a strong case for greater liberty in the matter of analysis, fully protected as is the user, both from brittleness and from undue softness, by the physical tests. There is still sufficient spirit of competition in quality among railmakers to make us believe that the wearing capacity of the average British rail might to-day be materially greater than it actually is had the manufacturers not been so narrowly limited in the matter of analysis during the past two or three decades. In more details than one, indeed, early revision of the B.S. rail specification seems imperative.

Emphasis was laid in the paper on the difficulty of obtaining from our existing physical tests any exact indication of the probable wearing capacity of the steel under test, and that an abrasion test really representative of the conditions to which the rail is subjected in service has yet to be devised. The ultimate strength of the steel, as expressed in the tonnage of the tensile test, was regarded as of little value, but attention was directed to the percentages of extension and reduction, and in particular to the elastic limit of the steel, as being likely to give considerable help in this matter. For it was remarked that hitherto too much stress has been laid on the hardness of the steel (as witnessed by the increase of carbon content in what has proved an abortive attempt to add to wearing capacity), and too little on toughness, and that something resembling the resilience of rubber is needed in rail steel, so that it is reasonable to look to the elastic limit for a measure of these resilient qualities. Such considerations as these have led to the present-day quest for a rail steel with a capacity for work-hardening, of which the supreme example is found in the manganese alloy steel associated with the name of Sir Robert Hadfield, to whose work in the evolution of the hardest-wearing rail known, tribute must be paid. But the chief need is for the evolution of a rail with at least some work-hardening capacity at a price not greatly exceeding that of ordinary steel—that is to say, for the improvement of the rail of standard analysis with as little recourse as possible to costly alloys.

The heat treatment of rails, with a view to the toughening of their wearing surface, next came under review, and appreciation was expressed of the patient research work towards the improvement of the rail that has been carried out by the late Mr. C. P. Sandberg and his successors. Furthermore, it would appear that in the latest development of the Sandberg sorbitic treatment—known as the regulated sorbitic process, which was briefly described in our February 16 issue—a substantial step has been taken towards a rail, at a price less than 25 per cent. above normal, with work-hardening capacity. One feature of this treatment, bearing on the relation between tests and potential wear, discussed in the last paragraph, is that whereas the tensile strength of the steel in the rail-head goes up by roughly 20 per cent. as a result of the treatment, the elastic limit increases by more than 50 per cent., and a limit of proportionality, as between elastic and ultimate, of 75 per cent. has been reached. The value of retarded cooling in the Sandberg oven was also claimed for all classes of rail steel, and we hold that this treatment is not merely a protection against fissuring, but is a positive assistance to rail wear in the improvement so brought about in the structural condition of the rail-head, as is evidenced by higher percentages of extension in the tensile test without any reduction of tonnage. Such were some of the main features of a paper which was on a high level of interest, and is likely to be of no small value in the future improvement of the railway rail. And the maximum of improvement will only be reached as the railway engineer, the metallurgist, and the manufacturer meet on equal terms, and pool their varied experience for the common good.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of Correspondents)

The Signal Engineer's Department

Queen's Road,
Bayswater, W.

March 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The Signal Engineer, as a distinct engineer, is necessary, as in latter years signalling has come more and more into prominence. The potentialities of this branch of engineering are vast and still greatly undeveloped. Given further prominence and power on a railway there is no doubt the signal engineer can provide still safer facilities for travelling and speeding up of trains, besides combining these two features with economy.

With the growth and economic development of the Colonies, railways will become more important and necessary, and signalling will be required to be more up to date.

I remain, sir,

Yours faithfully,

S. L. ROBINSON

A.T.C. in Switzerland

Swiss Federal Railways,
Berne.

March 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the February 16 issue of THE RAILWAY GAZETTE you published a description of the Signum train control system, as now adopted by the Swiss Federal Railways, which is based on a short note recently sent to the press by our management, giving a much simplified diagram in order to make it easier understood by the lay reader. On page 340 of your issue of March 2 you published a letter, signed "Amateur," referring to your description, and added an editorial note severely criticising the system.

We take the liberty of asking you to inform your readers that within one or two months we propose to send you a detailed description with diagram, which will show clearly that the criticised deficiencies do not exist. Thanking you in advance for attending to our request, we remain,

Yours faithfully,

HANS ETTER,
General Manager

Colours for Locomotives and Cars

Wheaton, Illinois, U.S.A.,

January 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In reading your descriptions of cars and rolling stock for various railways and countries, it is often disappointing to find no particulars of the colour schemes, since the colour seems to be a not unimportant matter, as affecting costs and durability of paints under varying conditions, besides being a feature in publicity and popularity.

As to English locomotives, in a visit last year it was rather a surprise to see so many locomotives sadly in need of painting, even on important trains, but this condition is due evidently to the general depression and the need for close economy. Of course, the mechanism and the efficiency of the machine are not affected. But on the London & North Eastern it was a problem to determine whether the standard colour was green or black, since so many engines of both colours were noted. For some reason, green appears to be the colour most favoured, although used in different shades and varieties. The old blue and yellow colours seem to have disappeared.

On American railways the colour for locomotives is universally and uniformly black, hardly relieved by the

lettering and numbering in gilt or aluminium, and relieved to only a slightly greater degree by the official label or "trade mark" on important roads. Economy in cost and maintenance is the main reason for this uniformly gloomy appearance. Several years ago, before a society of railroad mechanical officers, I suggested distinctive colouring as a form of advertising and of attracting public attention and interest. Although the suggestion met with no great approval, I still hold to the same opinion. Limited exceptions to the rule include the electric locomotives on the 660 miles of electrically-operated mountain divisions of the Chicago, Milwaukee, St. Paul & Pacific Railroad, which are orange-yellow, to conform to the colouring of the cars, and also a few locomotives on other roads when assigned to certain trains or for exhibition purposes.

With our cars there is not much greater variety, for the great majority are of a uniform colour which to all intents and appearances is black. The actual colour, when new, is a dark brownish green, or invisible green, which becomes practically black after a few weeks of exposure. Beyond the name and numbering in gilt there is little to relieve the appearance of a train of black cars headed by a black locomotive. Exceptions in this case include the orange-yellow just mentioned and the brownish-red of the Pennsylvania Railroad, which is quite different from the crimson of the London Midland & Scottish Railway. But the once familiar and striking canary-yellow of the Chicago & North-western Railroad was replaced a few years ago by the uniform black or so-called green. On the other hand, some city electric railways or tramways, and electric interurban lines have changed from dark to bright and distinctive colours as aids in popularising and advertising their services.

Yours very truly,

E. E. R. TRATMAN

Rail and Air Competition

2, Meetinghouse Lane,
Sheffield.

March 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I observe from a recent number of THE RAILWAY GAZETTE that in addition to expressing regret at the giving up by Imperial Airways of the rail section between Paris and Brindisi, which was bound to come, you consider that air traffic will before long become a serious competitor to the railways.

There is no doubt, unfortunately, that a good deal of first class traffic will be lost to the airways, but can it be seriously contended that the aeroplane is likely to become a serious competitor to the railway, even to the extent of superseding it in a generation or so as some air enthusiasts like to prophesy? The aeroplane, although quicker, has very much less carrying capacity, is a more costly means of transport and has not the comfort of the train. Is not air sickness a frequent accompaniment of air travel?

All those interested in railways should remember the heavy subsidies which are given in various ways to enable planes to fly in nearly all countries. In England there is a constant demand for municipal aerodromes to be provided out of the rates, to which the railways have to contribute. The fact is, ever since the war air transport has been constantly bolstered up by governments.

The railway is the only system of transport which combines speed with cheapness of carriage, high carrying capacity, comfort and reliability in severe weather conditions. The railways should meet aerial competition by improved train services and rolling stock and also by keeping first class fares well below air fares.

Yours faithfully,

PHILIP W. MERCER

PUBLICATIONS RECEIVED

Bradshaw's Continental Guide, and Bradshaw's Continental Handbook. London: Henry Blacklock & Co. Ltd., Bradshaw House, Surrey Street, Strand, W.C.2. 6½ in. × 3¼ in. Price 3s. 6d. net each.—For many years published as one volume, the Continental Guide and Handbook have since the War appeared in two parts, the former with a pale blue and the latter with a pink cover. This division is not without its advantage to the traveller, as each volume is only 3¼ in. thick, and the problem of its inclusion in the congested contents of the average suitcase is thereby solved. The format of the Guide corresponds generally with that of its better-known British relation, and covers the railway and steamer services of Europe, Syria, Egypt, and North Africa. In the services of the countries more remote from Great Britain, such as those of Eastern Europe, large towns only are shown; and in the majority of services only the principal stations figure, though the details become more ample as Western Europe is reached. Mileages on all routes and fare tables of each country are included, which simplify the work of calculating the approximate cost of a journey. A little more precise information as to restaurant car and sleeping car services, that is, the beginning and ending of their journeys in each case—would be helpful. The Handbook is an extremely useful companion to any Continental traveller; like the Guide, it is divided up into countries each one beginning with general notes as to passports, money, language, pronunciation of names, and other items of information and continuing with a list of cities,

towns, and holiday resorts, alphabetically arranged, and with notes as to all the principal features of interest in the town and its vicinity. The value of both Guide and Handbook is enhanced by the comprehensive list of hotel advertisements which each contains. The Guide is published five times a year, and the Handbook is revised annually.

Technical Thermodynamics. By Prof. Dipl.-Ing. W. Schule. Translated by E. W. Geyer, B.Sc. London: Sir Isaac Pitman & Sons Ltd., Parker Street, W.C.2. 9½ in. × 6 in. 623 pp. 323 line drawings. Price 40s. net.—On account of its size and mathematical nature, this is an awe-inspiring book. From its title it would appear to deal with things outside the engineer's purview as well as inside. The book is in fact, however, primarily a treatise on the properties and engineering applications of steam, though internal-combustion engines, pneumatic power transmission, and refrigerating machines are all usefully dealt with. The mathematics are nowhere unduly difficult, though here and there expressions look unfamiliar because of the use of symbols differing from those used in standard British works, e.g., in Ewing's "Thermodynamics for Engineers." A criticism of the book from the beginner's point of view is the lack of exercises and the interpolation of sections suitable for a second, third and fourth reading of the subject of thermodynamics with ordinary text-book material. But its value to readers familiar with the more commonly-used formulae and charts should be very considerable. Many

numerical examples are included in the text and, to assist calculation, there is a steam table and several folding and full page charts relating to steam and other fluids. The value of the book as a work of reference is not to be judged by its index, which is definitely inadequate and fails to do justice to the complete and up-to-date mass of information incorporated.

Handbook of Information and Indexed List of British Standard Specifications. (CD. 2000), January, 1934. London: British Standards Institution, Publications Department, 28, Victoria Street, S.W.1. 8½ in. × 5½ in. Pp. 68. Price 1s.—This is the half yearly handbook and indexed list of British Standard Specifications. The section devoted to current lists of British Standard Specifications includes a numerical list, the new specifications in course of preparation, and a complete subject index. The organisation, membership, aims and objects of the institution are set forth, as well as a number of points of interest.

Edgar Allen Products.—Edgar Allen & Co. Ltd., Imperial Steel Works, Sheffield, 9, has produced an illustrated, alphabetical guide to the complete range of the firm's products. Ready reference is facilitated by index tabs on the pages, permitting the desired section to be turned to in a moment. The firm has also issued a folder descriptive of manganese steel switch and crossing work. The most eloquent testimony to the durability of this material is given in the information about Baker Street station, Metropolitan Railway. A scissors crossover was laid in there on November, 1912, and was still in service in 1930, despite the 1,000 trains a day that pass over it.

The New Germany and the Railways

A remarkable mirror of events which have taken place on the German State Railway since the rise of Herr Adolf Hitler is contained in the Reichsbahn Almanack* for this year, and in many of the illustrations one sees the working of the National Socialist influence. The first page gives ample evidence of this with a striking drawing entitled "Full steam ahead into the New Era" (*Mit Voldampf in die Neue Zeit*) and depicting a train speeding towards a sunrise wherein the familiar disc is replaced by a radiant swastika. The inaugural electric suburban train on the Stuttgart-Esslingen service is shown decorated with this same emblem of the Idea. As is always the case, the standard of illustration is very high and the subjects equally interesting.

* *Deutsche Reichsbahn: Kalender 1934.* Issued by the German State Railway Press Service. Leipzig: Konkordia Verlag, Goethestrasse 6. 10½ in. × 5½ in. × 3¼ in. 160 sheets. Price RM. 3.20.

The expressing of light goods and parcels by the fastest passenger trains is featured, while a curious example of the German love of order is shown in the provision of a special side-door dog compartment in a passenger brake van. Other developments which are illustrated include the electrified Wannsee line, the Flying Hamburger (travelling at full speed through the forest near Friedrichsruh), the operation of mystery excursions by the Lübeck-Büchen Railway, and the running of the first electric express between Munich and Stuttgart.

Various photographic reproductions are included which possess considerable historical and political interest, among which may be cited a scene at Nuremberg showing the arrival of some of the thousands of storm troopers who were concentrated there during the celebration last September. Another shows the train of Mitropa cars which accommodated the diplomatic visitors on that occasion. Many are the pictures that

will delight the heart of the photographer, quite apart from technical or historical interest. One of these shows a song thrush's nest, with the bird sitting, built in the angle of a wagon frame immediately behind the buffers.

The nave-like effect of the Stuttgart station entrance, an aerial view of the Müngsten steel arch bridge, and some of the winter and springtime scenes, are but a few of the examples of railway aesthetics given in the course of this pictorial review. Typically German are the *D-Zug* guard waving his hand semaphore and the crow's-nest signal box at Kammereck, but most typically German of all is the brilliant cover design, showing a gate-keeper's garden by the line side. Two things account for this: one is the gate-keeper himself, standing stiffly at attention while a train passes; the other is the immense sunflower towering above him.

A selection of the illustrations from this *Kalender* is, by courtesy of the German State Railway Company's Press Bureau, reproduced on pages 494 and 495 of this issue.

THE SCRAP HEAP

One shovelful of coal saved in every ten miles, we are informed, would reduce a railway company's consumption by a hundred thousand tons a year. It would be interesting to have this stated in terms of waiting-room fires.—From "Punch."

* * *

TO-DAY'S UNUSUAL GOOD TURN

A porter at East Ewell (S.R.) station saw a woman, with a small boy and a girl, try to board a train as it was moving off. The girl got in, but her mother and brother were left behind. The porter, thinking of the little girl's state of mind, jumped on to the foot-board, entered the compartment, and travelled with the child to Epsom. There he stayed with her until her mother arrived by the next train.—From the "Evening News."

* * *

Two stationary steam engines which are still used by the L.M.S.R. have a combined record of 222 years of active service, and are "still going strong." The older, designed by James Watt, and built 121 years ago—before the railway itself—is used for pumping out the graving dock at Holyhead, and retains all its original working parts. It works off only 5 lb. pressure of steam, compared with 250 lb. of the latest type of locomotive. Junior by 20 years only is the winding engine used for the Swanington (Leicestershire) incline of the L.M.S.R. It was built by the Horsley Coal & Iron Company, of West Bromwich, Birmingham, and installed in 1833.

* * *

The late Lord Aberdeen was very keen on railways. Some years ago he made a record of the noises to be heard in a railway station before the departure of a train—the engine getting up steam, porters calling out names of stations and directions for luggage, the guard blowing the whistle, and the train puffing out. And he did the whole record himself, making all the noises just as does Reginald Gardner in his train monologue.—From the "Daily Mail."

* * *

1st Man: Bet you 6 to 1 this train won't pass Bletchley within the hour.

2nd Man (with emphasis): Taken, my friend, taken.

1st Man: You seem very confident?

2nd Man: I am; we passed Bletchley five minutes ago.

* * *

IN PLAIN ENGLISH

In a railway prosecution at Willesden Police Court the other day it was stated that passengers had failed to understand the words "Not transferable" on season tickets, and accordingly "Only one person may use this ticket" would be printed.

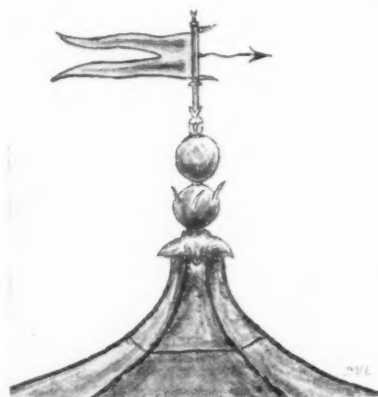
WHEN SWINDON REPAIRED A WEATHERCOCK

The fact that the famous weathercock on Tom Tower, Oxford, was repaired in the Swindon railway workshops, G.W.R., more than ninety years ago is revealed in some correspondence which passed in the year 1842 between Dr. William Buckland—a Canon of Christ Church—and Mr. (afterwards



Tom Tower, Christ Church, Oxford

Sir) Daniel Gooch, Bt., Locomotive Superintendent of the Great Western Railway. It appears that the weathercock, which weighs nearly one hundred-weight, had on occasions ceased to revolve, and as the College authorities had difficulty in finding a lasting remedy, Dr. Buckland, after much deliberation, consulted his friend Daniel Gooch. The engineer inspected the



Sketch of the weathercock on Tom Tower which was repaired by the G.W.R. in 1842

agate ball upon which the weathercock revolves and suggested the provision of two ball-bearing gun metal collars to be screwed round the spindle. He also offered to provide the collars if Dr. Buckland found any difficulty in getting them made to his requirements.

In accepting Daniel Gooch's offer, Dr. Buckland wrote, "By your proffered aid to facilitate its revolutions you will become a benefactor to the foundation of Henry VIII and Wolsey," allusions, of course, to the Cathedral Church of Christ and to Wolsey's foundation of the Cardinal College. Swindon works duly manufactured the gun metal collars, and the weathercock was restored to its original usefulness. Acknowledging Gooch's assistance, Dr. Buckland said he "could see no cause why the work should not last a hundred years on its highest point of exaltation in the University, and when the railway is made hither be admired as the most perfect wind indicator in Oxford by more engineers than frequent the City at the present time." The railway to Oxford was opened some two years later. As testimony to the value of the remedy suggested by Daniel Gooch, it may be said that no repairs are known to have been necessary to the weathercock until the year 1906, when Tom Tower was restored, and that to this day the weathercock is still very sensitive on its bearings.

* * *

A reader asks if he is particularly unlucky, or whether there are others who continually meet in their travels:

Elderly ladies who enter smokers, and who, after coughing, then staring, finally pass sarcastic remarks when I have got my pipe going good and hearty?

Small children who prefer my lap to their parents'?

People standing in crowded tubes who prefer the support of my back to the strap above their heads?

Individuals who ignore the provision on the train of a luggage-van, and precariously balance ominous pieces of bulky impedimenta on the frail rack above me?

Card-playing enthusiasts who look indignant when I refuse to let my knees do part service for their spread newspaper?

Ladies in thick fur coats who want the windows open on the coldest of days?

Gentlemen in no overcoats at all who want the windows up on the warmest of days?

Children who pay half-fare but occupy whole seats?

Scaly clothed gentry with large bags of odoriferous fish?

Portly and somnolent men who settle themselves in the corner seats at an angle when the compartment is packed?

Bony people who think my ribs the most comfortable resting-place for their prodding elbows?

Shag smokers?

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

New Zealand trains used as hotels for Dominion festival—Indian budget programme for 1934-35—Safety of unguarded level crossings in Spain—Railway extensions in China and Manchuria—The Lagny accident in Parliament—Privileges for school children on Swiss railways

NEW ZEALAND

Event of the Month

The national event of the month in New Zealand is the celebration of the Treaty of Waitangi, made on behalf of Great Britain by Captain Hobson with the native Maori race ninety-four years ago. The New Zealand Government Railways Department has made extensive preparations for carrying the many thousands who are gathering for this great Dominion festival. The accommodation in the vicinity of Waitangi (near Russell, the deep-sea fishing centre) is comparatively limited, and it is anticipated that quite a number of the official party will have to make the trains their headquarters during the brief stay there. Thanks to similar previous experience, the railways are in a position to supply a complete hotel service on the train, including shower-baths, recreation rooms, dancing facilities, and de luxe meals and service for those fortunate enough to be billeted on such trains.

The Governor-General of New Zealand, Lord Bledisloe, recently presented to the nation the buildings and grounds made famous by the treaty, and all New Zealanders who can possibly do so will be there to see the ten thousand Maoris, brought in by train from all parts of the country, go through the ancient rites, the hakas and the tribal ceremonial observances, as well as the huge feasting—on miscellaneous foods cooked in the famous hangis, or Maori ovens (the kopa-Maori)—which invariably crowns a native gathering of this kind. For in no country in the world has a native race been better assimilated by settlers than the Maori, and nowhere has a treaty been better observed than New Zealand's Waitangi.

Rising Traffic Tide

The latest information regarding railway buoyancy in New Zealand is furnished in the financial results of railway working up to January 6, 1934. For the four-weekly period which ended on that date the revenue showed an increase of £55,310 compared with the corresponding four-weekly period of last year, and expenditure an increase of £5,038, resulting in an increase in net revenue of £50,272. For the period April 1, 1933, to January 6, 1934, revenue increased by £164,241 and ex-

penditure decreased by £39,082, resulting in a net increase for these 40 weeks of £203,323 as compared with the previous financial year.

The recent Christmas and New Year traffic in New Zealand has been better than for many years past, and it is obvious that the generally increasing popularity which our railways are now enjoying is due to the economies which train, as opposed to road, travel makes possible. The additional safety of rail travel, particularly during weeks when the roads are rather crowded, is a further factor in the upward trend of passenger rail traffic. But freight is also showing a marked improvement, partly due to better prices for wool and meat, and partly to the promptness with which, in rush periods, the railways here can handle consignments.

INDIA

Indian Railway Budget

According to the estimates presented by Sir Joseph Bhole, Member for Commerce and Railways, in the Legislative Assembly on February 17, the final results of the working of Indian Railways during 1933-34 are not likely to differ greatly from the original budget. Even with a drop of over a crore in passenger receipts, the total receipts for the year are expected to reach Rs. 88½ crores, due solely to improvement in goods traffic. This represents an increase of Rs. 2 crores or 2½ per cent. over the figure for last year. The working expenses, including depreciation, amounting to over Rs. 64 crores, will be a little higher than in the previous year, the increase being accounted for by the reduction from 10 to 5 per cent. in the emergency cut in pay. Flood and earthquake damage has also necessitated unexpected expenses. The breach in one of the protective works of the Hardinge Bridge last September involves the expenditure of about a crore and a half in strengthening and extending the protection and training works. Provision has also to be made for alternative means of communication if the safety of the bridge is seriously threatened during the next monsoon. The cost of repairs to earthquake damage is estimated at about a crore. All this expenditure will initially be debited to the Depreciation Fund and

repayments from revenue will be made in annual instalments of Rs. 15 lakhs. Appropriation to the Depreciation Fund will come up to Rs. 13½ crores. The lower rates at which the Government has been able to borrow during the year have reduced the interest charges by about Rs. 50 lakhs and the final result for the year will be a deficit of Rs. 7½ crores, including the usual loss of about Rs. 2 crores on strategic railways. This loss will be met by a temporary loan from the Depreciation Fund which, at the close of the year, will stand at Rs. 11½ crores.

Estimates for 1934-35

Neglecting the effect of the inclusion of the receipts and expenditure of worked lines, the total receipts from State lines for the coming year, 1934-35, are put at Rs. 91½ crores, and the total expenditure, including depreciation, at Rs. 64½ crores. With the interest charges reckoned at Rs. 32 crores, the total deficiency for the year should be approximately Rs. 5½ crores. This amount will be borrowed from the Depreciation Fund, leaving to the credit of that fund at the end of 1934-35 a sum of Rs. 11½ crores. In view of the steady upward trend in goods traffic, the Railway Member thought that he had not been unduly optimistic in estimating for next year an increase in traffic receipts to the extent of Rs. 2½ crores, an improvement of 3 per cent. on the figure for this year. The increase in working expenses is mainly the result of the normal increments earned by the staff on time-scales of pay. The ordinary working expenses have been steadily reduced from year to year ever since traffic began to drop. Much of the reductions represented merely a postponement of expenditure. In the opinion of the Railway Member, the time is soon coming, if it has not already come, when it will be unwise and indeed unsafe to postpone it any longer. The most hopeful prospect of reducing expenditure still further seems to lie in the detailed job analyses now being conducted on various railways on the advice of Mr. Pope. If traffic continues to improve, no further block retrenchments should be necessary.

Works Programme

The programme of works for 1934-35, though less ambitious than in pre-depression days, is still considerably more extensive than in the past two years. A total expenditure of Rs. 14 crores is proposed, of which Rs. 75 lakhs will be found by a further reduction of stores balances. A small expenditure of Rs. 11 lakhs is provided for new construction, to be mainly spent on constructions in hand. One small five-mile railway in South India will be built. The Bombay-Sind connection and the Pollachi-Vananturai line are still under examination in regard to their remunerative possibilities. As regards open line works, the programme includes Rs. 4½ crores for

track renewals, and Rs. 3½ crores for rolling stock, in addition to Rs. 1½ crores for works in progress. The amount provided for new works is under Rs. 4½ crores and includes a sum of about Rs. 1½ crores for repairs and additions to the protection works of the Hardinge Bridge and for repairing earthquake damages. Another item of importance is the remodelling of part of the Jamalpur workshops on the East Indian Railway. As a measure of economy and efficiency it is intended to concentrate upon heavy repairs to engines.

Railways and their Competitors

The Railway Member's budget speech concluded with a reference to the attitude of the railways to competitive forms of transport. On behalf of the railways Sir Joseph wished to combat any impression that the railways desired to maintain at any cost and by any means a monopolistic position from which to exploit the public. They wished to eliminate wasteful competition so that the available resources of the State might be utilised to the best advantage of the public. It was obviously in the public interest that such limited funds as there were should be spent on opening up new areas rather than on the duplication of the existing lines of communication. The Government of India was in communication with the local governments on the resolutions passed at the joint conference at Simla last year. It is claimed that a beginning has been made in attracting the serious attention of the various authorities concerned to a problem which has been found so difficult of solution in other parts of the world.

SPAIN

Accidents at Level Crossings

In 1929, the Spanish Government authorised the railway companies to withdraw the crossing keepers from certain level crossings where the road traffic was only of minor importance, specially designed caution signs being placed at a certain distance from the railway to warn drivers of road vehicles of the proximity of the crossing. In the last few years the number of fatal accidents that have occurred at level crossings has increased considerably, and for some time past the press has given prominence to these unfortunate disasters, attributing the increase to the large number of unguarded crossings. An important Madrid daily, in a recent issue, reported three such accidents, and in commenting on them suggested that had the level crossing keepers been retained, the risk of accident would have been lessened or prevented. The Northern of Spain Company, on whose lines two of the accidents occurred, has replied to the accusation. It appears that the result of the official inquiry showed that, in two of the three cases, the level crossings were guarded by the regulation barriers; in one case the road

vehicle not only was not caught by the train, but was actually proved to have rammed the locomotive, and in the other case the road vehicle burst through the barrier. Apart from this the reply is interesting inasmuch as, in addition to the proofs offered, showing that the drivers of the road vehicles were at fault in both cases, it quotes some rather eloquent figures. On the lines owned by the Northern of Spain Company, there are 2,536 level crossings, of which 889 (or 35 per cent.) are guarded, and 1,647 (or 65 per cent.) unguarded. In the year 1933, there were 90 accidents at level crossings, and of these 55 (or 60 per cent.) occurred at guarded crossings, and 40 per cent. on unguarded crossings. In other words, the number of accidents per crossing on those with keepers is more than double the number on those at which the regulation caution signs only were used.

These figures effectively dispose of the arguments raised by the press as to the safety of unguarded level crossings, and—although the number and nature of the vehicles using the road and topographical conditions are probably the most important factors ruling the frequency of accidents at level crossings—it certainly seems as if the facts and figures quoted by the Northern of Spain Company dispose of the somewhat exaggerated arguments of the press.

Railway Electrification

In connection with the electrification of the Northern of Spain lines between Madrid and Avila and Segovia, it is understood that negotiations are well advanced for the formation of a consortium between certain well known international groups—most of which are already represented by their respective Spanish houses—with a view to complying with the condition laid down by the Spanish Government that the materials must, wherever possible, be of national production and manufacture.

Financial Results for the Year 1933

Information is now available as to the gross receipts of the four principal Spanish railways for the year 1933. The figures, which are only approximate, pending the publication of the respective annual reports, are as follow:—

	1932	1933	Fall
	Millions of pesetas		
Norte ...	351.1	336.4	-14.7
M.Z.A. ...	289.4	282.0	-7.4
Andaluces ...	57.0	51.8	-5.1
Oeste ...	38.1	36.9	-1.2

The reduction in the earnings of these companies is even more serious when it is remembered that this is the third successive year in which there has been a fall in receipts. Moreover, the economies which in previous years to some extent offset the drop in earnings, have not been able to be continued in 1933, as obviously there is a limit to the extent of the cuts which can safely be made in maintenance and working costs.

THE FAR EAST

Super Trains for Manchukuo

All express trains of the South Manchuria Railway between Dairen and Changchun (Hsinking) are to be fitted with wireless for the use of travellers. There are now in course of construction 18 new dining cars, in which will be served Japanese, Chinese, and European foods; they are to be ready in time for the acceleration to the mile-a-minute rate of the main Dairen-Changchun expresses, which is scheduled to come into operation during the coming summer.

New Construction and Combined Rail, Road and Ferry Services

It is reported that the construction of the Taierschwang-Chaochwang branch of the Lung Hai Railway in northern Kiangsu is now nearing completion. The formation is almost ready for platelaying and the permanent way and other materials have been collected ready for laying in the near future. Meanwhile, through rail and road services between points on the Nanking-Shanghai Railway and the Chinkiang-Yangchow highway were formally inaugurated on January 21, the Chinkiang-Lohyu Yangste ferry also being included in the scheme. The road services are run by the Highway Omnibus Company, which transports freight as well as passengers, according to the *Chinese Economic Bulletin*.

Chinese Financed and Constructed Railway

Particular interest attaches to the opening—which took place at the end of December—of the Kinghua-Yushan section of the Hangchow-Kiangshan Railway, as it has been financed and constructed entirely by Chinese, with the assistance of loans from the British Boxer Indemnity Fund, so far as the recent extension to Yushan is concerned. The line runs through the province of Chekiang, and the Provincial Government and banking interests have been largely responsible for the financing. Though it forms a part of one of China's main trunk lines, it has been constructed remarkably cheaply for a standard gauge railway, the cost per mile being only \$60,000 (about £4,000). This result has been achieved by using very light rails weighing only 35 lb. a yard, and sleepers of imported pine, 14 to the rail-length. The bridges, moreover, are not all of a permanent character, some being of wood and others of old steel spans from the Shanghai Hangchow Railway. It remains to be seen if a line so lightly constructed will stand up to traffic. It is, however, understood that this standard of construction is up to that of other Chinese Government Railways, and the intention is to relay with heavier rails and replace weak bridges with reinforced concrete and heavier steel spans as and when traffic justifies the additional expenditure so involved.

The locomotives, which have a maximum haul of 300 tons, are capable of attaining a speed of 50 miles per hour. At present nine locomotives are in operation and a further six have been ordered. Twenty-four new passenger coaches and fifty goods wagons have also been placed on order, the cost of which will be met by a loan from British Boxer Indemnity Funds. First, second and third class accommodation is provided for the passengers. Many of the lines in China provide fourth or coolie class accommodation at a cheap rate. In some cases full trains of fourth class stock only are run and are well patronised by the country people.

Proposed Kiangshan—Pinhsiang Railway

An extension of the Hangchow-Kiangshan railway is being considered by the Ministry of Railways with a view to continuing the line to the Hunan border at Pinhsiang. Chinese capital is to be used, funds being subscribed locally in the province and also from Government funds.

FRANCE

Lagny Debate in the Chamber

The debate on the Lagny disaster was resumed and concluded in the Chamber of Deputies prior to the adjournment for the Easter recess after the postponement due to the Stavisky affair and the change of Government. M. Pierre Etienne Flandin, the new Minister of Public Works, in summing up the debate, exonerated the railway workers from any blame and said there was no truth in the allegation of a go-easy strike on December 23 in the Ourcq depot where the trains are made up. It was also untrue that the number of men at work in the depot was less than in the corresponding period of 1932. A report that the lines were encumbered by coaches awaiting repairs was also denied. But the Minister added that he could not agree that the atmospheric conditions were a justification of the disorder which prevailed at the Gare de l'Est.

In co-operation with the railways, continued M. Flandin, the Ministry of Public Works was proceeding to carry out measures intended to prevent the recurrence of similar disturbances in the railway service. Twelve million francs would be spent on the Ourcq depot. Suppression of trains must not be left to hazard and the service of control was preparing supplementary orders to be imposed in case of fog. The demand for steel coaches would call for a maximum of 8,500 at the height of the traffic, whereas the railways had only 3,000 such coaches available. Each steel coach would cost from 400,000 to 500,000 francs and this indicated the heavy total expenditure involved. On the other hand, the steel vehicles were heavy and new traction problems would be raised.

Although the Est had an efficient signalling system on the line from Paris to Lagny, he was not satisfied with signalling conditions. For instance, it had been indicated that the light from two red signals might appear pink or yellow in a fog. It was quite certain also, asserted M. Flandin, that white for line clear was a bad colour and it was agreed that it should be replaced by green, with yellow for the distant signal. As far as the Minister was concerned, it seemed that no blame could be attributed to the fixed signalling, but there was the question of repeating the signals in the cab. There must be no departure from the principle that repeating can never replace the actual signal. The Flaman recording graph, in particular, has no value beyond that of control. Otherwise it gives only a false security. In general, said M. Flandin, failures of the "crocodile" are so numerous that it offers a very doubtful security.

Future Signalling Plans

M. Flandin stated that in assuming office as Minister of Public Works he had instituted an investigation of the American cab signalling apparatus. Unfortunately this was very expensive. It would cost 15,000 francs per kilometre and 30,000 francs per locomotive. The Minister added that the reorganised signalling plan, which his predecessor, M. Paganon, had asked the railways to prepare, has now been laid before the Conseil Supérieur des Chemins de fer. This plan provides first of all for the installation of automatic block signalling on 4,402 kilometres of line, greater development of despatching and more intensive trials of cab signalling.

Further, continued the Minister, it is indispensable to proceed with the quadrupling of certain tracks, especially in the Paris suburban area and notably between Paris and Lagny. In addition, improvements are proposed in the large stations of Paris and the provinces, including the suppression of a number of crossovers and the construction of new signal-boxes. A plan for providing immediate aid in case of accidents would shortly be put into application. In conclusion the Minister paid a tribute to the personnel of the railways. The Chamber by 400 votes to 180 expressed approval of the steps taken by the Government in connection with the Lagny disaster.

Minister's Personal Investigations

During the debate, M. Flandin explained that he spoke with a certain reserve because the inquiries into the disaster by the judicial authorities and the experts were still in progress. A few days before the debate, the Minister made a personal inquiry on the spot into the circumstances of the accident. He travelled in the cab of the locomotive from Paris to observe the working of the electric signalling and especially the repeating of signals in the cab. From figures furnished by

the company's engineers, it appears that the electric relays fail less frequently than mechanical signalling apparatus.

État to Operate Congo-Ocean Railway

One of the French colonial railways now approaching completion is to be operated by the State Railways of France. This is the line known as the Congo-Ocean between Pointe-Noire and Brazzaville. The Public Works Committee of the Chamber of Deputies has reported favourably on a bill authorising the administration of the State Railways to operate the line on behalf of the Government General of French Equatorial Africa. The conditions of operation will form the subject of a convention between the State Railways and the Colony, which will be approved by presidential decree. The remuneration of the State Railways will be based on a formula taking account of the receipts and expenditure and the tonnage transported.

Paris Metro Extensions

It appears from a recent debate in the Conseil Général of the Department of the Seine that the construction of some of the proposed suburban extensions of the Paris Metro has been postponed on account of the heavy financial expenditure involved in the building of some new sections of the underground inside Paris. Despite this, however, it has been announced that new contracts are to be placed for improvements and extensions of lines 8, 10 and 14 within the city. A councillor has now given notice of a question asking why new lines are built inside Paris, which can bring no additional passengers, in preference to the suburban extensions, which would tap new areas and add to the Metro traffic.

SWITZERLAND

New Cheap Tickets

To replace the winter week-end tickets, which are now no longer available, the Swiss transport undertakings have decided to issue so-called sports tickets for the remainder of the winter season, i.e., from March 24 to April 29, to about 200 sports centres. Different routes may be followed on the outward and return journeys. The cheap Saturday and Sunday tickets are being extended to include the Easter holidays.

Certain travel privileges are being granted to young people during the two weeks April 9 to April 22, when most of the school youth is on holiday. The privileges enable each traveller paying a full fare to take with him, without further payment of any kind, two children under the age of 12, or a young girl or youth under the age of sixteen. This favour will be granted to all persons buying a single, a return, a circular ticket with a fixed itinerary or a combined ticket.

OIL FUEL FOR LOCOMOTIVES

(From a Correspondent)

OIL has been used as fuel for locomotives on a large scale for over 60 years in countries where it is plentiful, particularly in Russia. In 1889 Mr. Urquhart used a petroleum residue on 143 Russian locomotives fitted with his burner; this was the first single large scale application of oil fuel to railway work. It is over 40 years since Mr. James Holden, then Locomotive Superintendent of the Great Eastern Railway, introduced his apparatus which enabled coal or oil to be used and which was adopted experimentally on other railways, and systematically on locomotives in the Dutch Indies, and elsewhere. The first locomotive burning oil with Mr. Holden's arrangement was the 2-4-0 locomotive *Petrolea* in 1887. With the Holden system on the old Great Eastern Railway, express trains of 225 tons were hauled on a consumption of 17.6 lb. of fuel oil per mile, compared with a coal consumption for similar working of 34 lb. per mile. American railways did not begin using oil fuel to any extent until about 1906.

The two burners in the Holden system are fitted in the foundation ring below the firebox door, and direct the flame towards the flue sheet under a fire-brick arch. In the Baldwin system used in America and in the Scarab system developed in Mesopotamia during the war there is no brick arch, the burner being placed at the flue sheet end of the firebox.

Oil fuel haulage and handling is much more economical than that of coal and in addition there is no ash to be dealt with. Tests carried out on a United States railway some years ago showed that 3.2 barrels of oil possessed the heating value of one ton of coal, or, put another way, one ton of oil was equivalent to 1.79-2.76 tons of coal, according to the quality of the coal. Boiler steaming capacity is increased fully 15 per cent. and the only physical effort required for firing is the turning of a valve. With liquid fuel the fire can be closely adjusted to the load without variation in steam pressure. Steam can be raised with such rapidity that an engine can be moved under its own steam within 35 minutes of the burners being lighted, and, of course, no firewood is needed. Shunting engines are liable to have to stand idle for long periods. The oil jets in such cases can be cut down to the minimum or even extinguished, as an engine will always retain sufficient steam to start up the burners again when required.

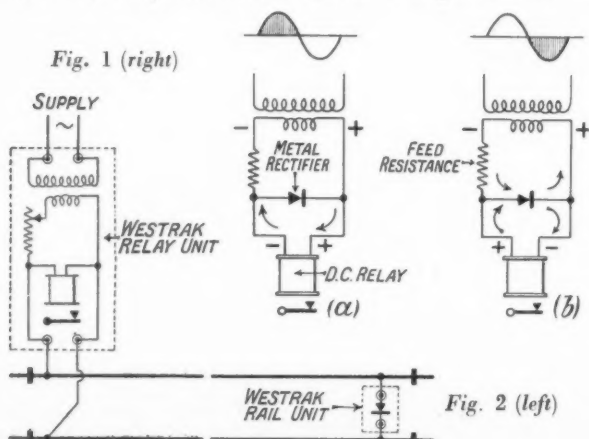
In exhaustive tests carried out on the late L.N.W.R. in 1920 with the Scarab system the oil consumption was 32 lb. a mile compared with 70 lb. for coal in similar conditions. With the production of fuel oil from coal having reached a practical stage in this country, the British railways might reconsider the question of oil as a fuel for locomotives.

A NEW TYPE OF RECTIFIER CONTROLLED TRACK CIRCUIT

THE application of metal rectifiers to railway signal track circuits, employing d.c. track relays in conjunction with a.c. feed systems, has been familiar for some time, but all such applications have in the past been of the conventional arrangement in which the track relay and feed connections are made at the two extreme ends of the track circuit.

An entirely new arrangement of a rectifier-controlled track circuit, which has been given the name of Westrak, has recently been produced by the Westinghouse Brake & Saxby Signal Co. Ltd., in which the feed set and track relay are both placed at the same end of the track circuit, thus giving, at once, simplified operation and adjustment of track circuits and marked economies in initial installation costs.

The principle of the Westrak circuit can be followed from the simplified circuit shown in Figs. 1a and b.



From the directions of current flow shown for alternate half-waves of the a.c. supply, it is clear that the half-wave rectifier connected across the d.c. relay serves the double purpose of by-passing alternate half-waves of the a.c. supply from the relay and affording the relay winding a path to maintain a circulating current during the inoperative half-wave of the a.c. supply. Thus although the relay receives impulses from the supply only on alternate half-waves the current through the relay winding never actu-



Fig. 3—Rail unit

ally falls to zero; in fact, the relay current fluctuates by only a small amount from the value required for correct relay energisation. The series resistance limits the current passing through the rectifier and also governs the mean d.c. value of current flowing through the relay winding.

Fig. 2 shows the complete Westrak circuit, with the half-wave metal rectifier connected between the rails at the far end of the track circuit. This rectifier is housed in a small rail unit, Fig. 3, and since no adjustments are required to this part of the apparatus, it is designed for mounting directly on a sleeper in the four-foot way. The

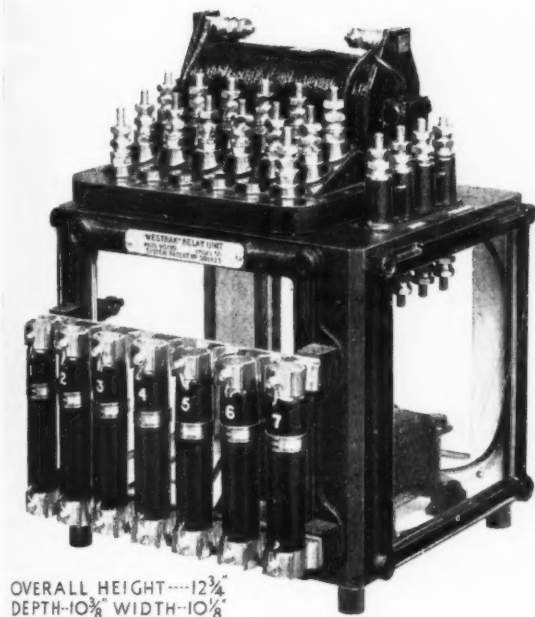


Fig. 4—Relay unit

unit is provided with protected external terminals for the rail connection.

At the feed end of the track circuit is the relay unit, Fig. 4, containing the feed transformer, the d.c. relay and adjustable feed resistances. These resistances are of the clip-in vitreous enamel type, mounted on two bus-bars on the front of the unit; suitable combinations of these

resistances give correct relay energisation over the whole range of track circuit ballast and rail resistances. Two terminals are provided on the unit for the a.c. supply, and two for connection to the rails.

Although the Westrak apparatus operates from an a.c. supply, it must be remembered that the d.c. relay would be open to interference on electrified roads, and therefore this apparatus can be used only on roads where ordinary d.c. track circuits are applicable.

A typical automatically-signalled section of line, employing conventional a.c. track circuit apparatus, is shown in Fig. 5a, and alternative lay-outs for the same section using Westrak apparatus are shown in Figs. 5b and c. It is clear from these circuits that the saving in installation cost for the arrangement shown in Fig. 5b is represented by two apparatus positions, but with the addition of extra cable, equivalent to the length of track circuit, C.T.,

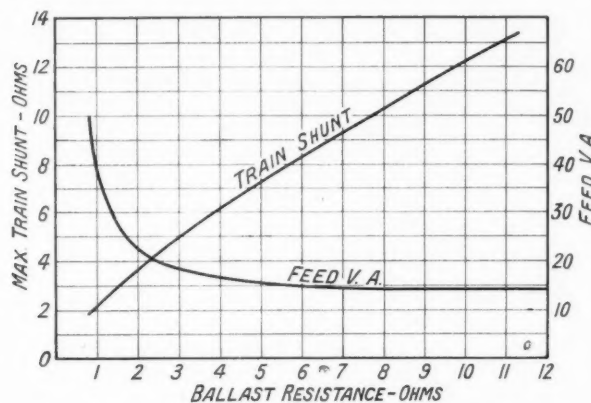


Fig. 6—Operating characteristics for Westrak circuit, 1,000 ft. long

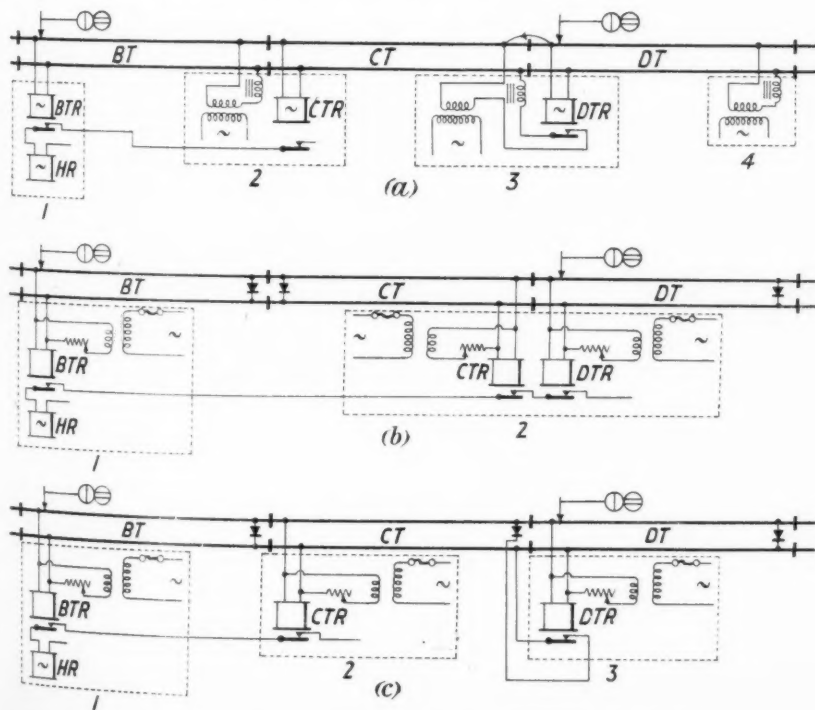


Fig. 5—Alternative layouts for a typical automatically-signalled line

while the saving shown in Fig. 5c amounts to one position without any additional cable.

Economy in cable and apparatus will also be obtained on isolated track circuits, such as approach track circuits, and Westrak apparatus will also be found particularly adaptable to highway crossing track circuits where the whole of the apparatus, with the exception of the rectifier rail unit, can be housed in one apparatus case at the crossing, no cabling to the far ends of the track circuits being necessary.

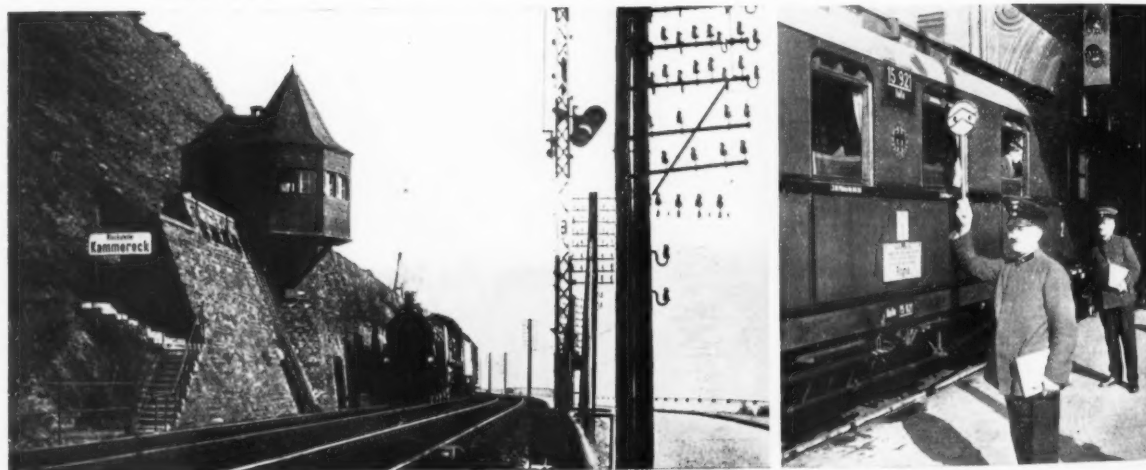
The values of train-shunt and current consumption of a typical Westrak circuit 1,000 ft. in length for ballast resistances up to 12 ohms/1,000 ft. are shown in curves, Fig. 6. It will be seen that the lowest value of ballast resistance, at which it is possible to work a track circuit of this length, is 0.85 ohm/1,000 ft., and the maximum value of train shunt under these conditions will not be less than 1.8 ohms.

Views on the German State Railway

(See page 487)



Left: Arrival of electric train from Munich at Garmisch-Partenkirchen in snowy weather

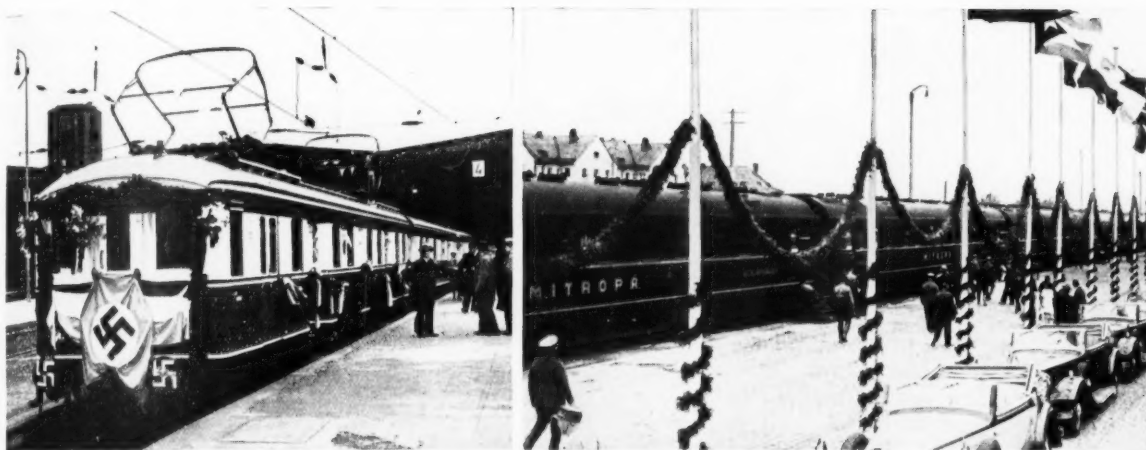


Below: Platform official giving right-away signal to driver

Above: Block signal cabin, Kammereck, near Oberwesel, Mainz-Koblenz section, designed to accord with its surroundings

Right: The Müngstener bridge near Solingen



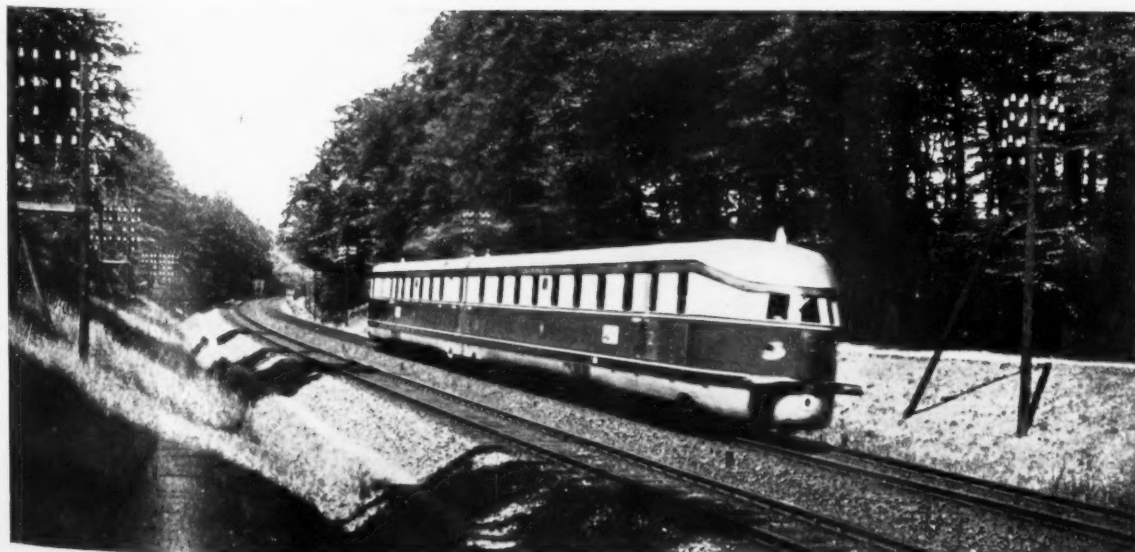


Above: (Left) First electric local train at Stuttgart; (Right) Special train for members of Diplomatic Corps at the Nuremberg National Party Congress in September, 1933



Left: Arrival of special trains at Nuremberg

Below: The Flying Hamburger passing through the Sachsenwald near Friedrichsruh



TEN-TON RAIL MOTOR CAR FOR THE ARGENTINE NORTH EASTERN RAILWAY

The chassis of this car, destined for logging service, was built by the Buda Company at its Hornsey Works



The car chassis undergoing trials

WE recently inspected at the works of the Buda Company, Hornsey, the completed chassis of a 10-ton railcar which has been built there for logging service on the Argentine North Eastern Railway, and herewith reproduce illustrations and a description of the chassis, which was tested on the L.N.E.R. recently between Stapleford and Watton, when some excellent results were obtained. The average speed for a distance of two miles with a 19-ton trailing load was 28 m.p.h., the speed on the level and unloaded rising to 30 m.p.h. In addition, the car easily shunted 23 tons in the goods yards.

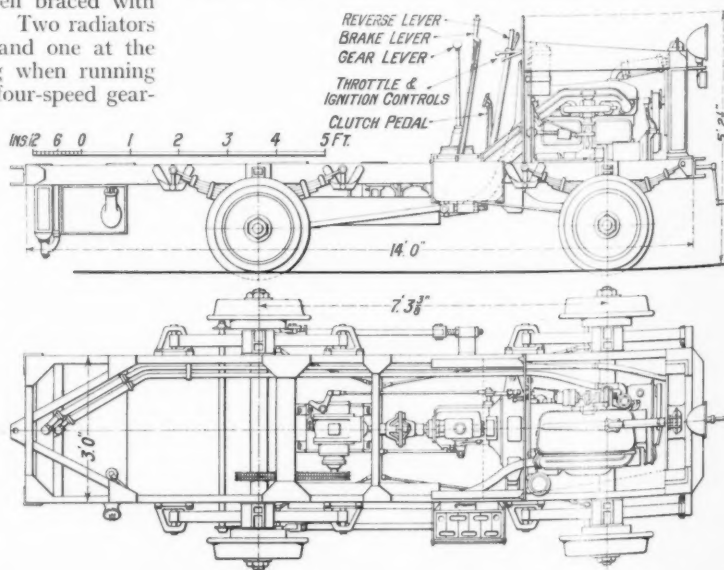
The chassis is robustly constructed. The frame is built up of $5 \times 2\frac{1}{2} \times \frac{1}{4}$ in. channel steel, well braced with cross members reinforced by gusset plates. Two radiators are provided in series, one at the front and one at the rear, the object being to improve cooling when running in the reverse direction. In the standard four-speed gearbox used the reverse gear is omitted, a separate reversing unit being provided, having an individual control lever. By this means the four speeds normally in the forward direction are also obtained in reverse.

The four-cylinder engine peaks at 1,900 r.p.m. and should, therefore, have a long life so far as moving parts are concerned. A maximum torque of 174 lb. is given at 1,050 r.p.m. The final drive is by duplex chain 1-in. pitch with 0.625-in. diameter rollers. Electric starting and lighting are provided.

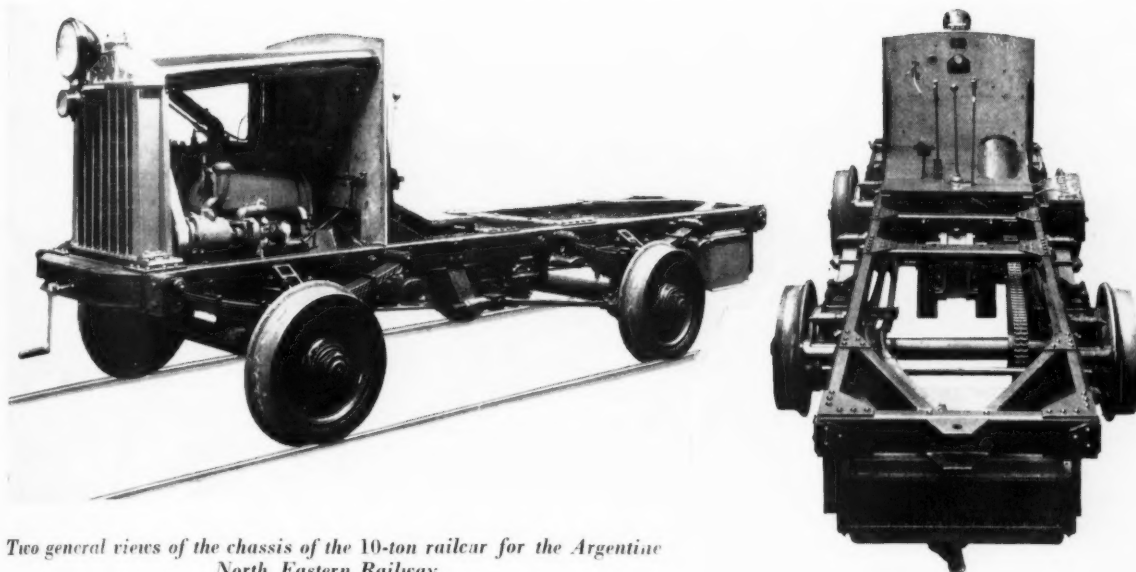
Both front and rear axles are 4 in. in diameter and are identical, except for a slight modification in the rear axle to take the driving sprocket. The axle is made of 3 per cent. nickel-chrome steel and is well supported by large-diameter Timken roller bearings with self-aligning races. The axleboxes are all inter-

changeable and heat-treated nickel-chrome bolts are screwed into the axlebox to hold the springs, a recess being cast in each box to receive the springs.

A further interesting point is the provision of check plates for each spring to prevent rolling when rounding a curve. The rear springs have swing shackle bolts at front and rear to permit of the adjustment of the driving chain, which operation is performed by means of two stout rods pinned at one end to the brake spider and having a screw adjustment at the forward end. There are brakes on all four wheels and they can either be operated by hand lever or foot pedal. Adequate braking area is secured by using brake drums $14\frac{3}{8}$ in. diameter.



General arrangement drawings



Two general views of the chassis of the 10-ton railcar for the Argentine North Eastern Railway

The periphery of the brake drums is not shrouded by the wheel, so that a good flow of air is maintained to ensure ample cooling.

Our inspection showed that the chassis was excellently

laid out with regard to design, whilst its manufacture was obviously of a high standard throughout. When placed in service the chassis will be equipped as a flat car for logging service.

The Last of Brunel's Wooden Viaducts



[Sandy]

[Truro]

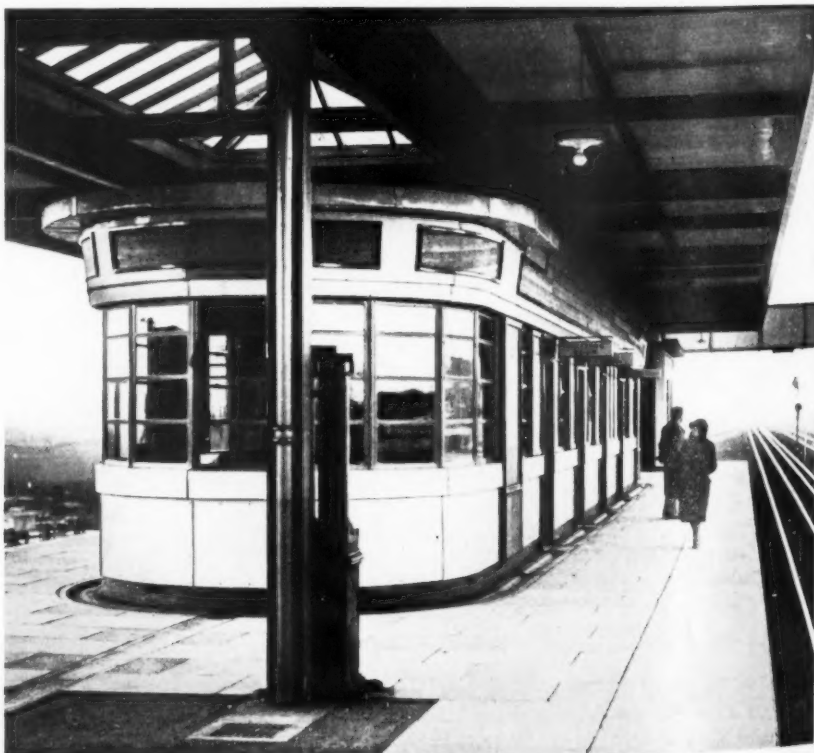
The last of the many wooden viaducts built by Brunel on the G.W.R. system is now being replaced by a modern structure at College Wood on the Truro-Falmouth branch. A comprehensive article on timber viaducts in South Devon and Cornwall was published in the October, 1931, issue of our associated monthly contemporary "The Railway Engineer"



Left : The Southern Railway English Channel train - carrying vessel "Twickenham Ferry" after having left the slipway at Newcastle-on-Tyne on March 15 (see article on page 501)



Above : Sentinel-Cammell railcar on the bridge over the river Oñel, Zafra-Huelva Railway, Spain (See article on page 511)



Right : The new platform buildings at the recently-built L.M.S.R. station at South Kenton. The station was brought into use on July 3 last, but the fine modern platform buildings were then uncompleted. (See editorial note on page 481)

RAILWAY NEWS SECTION

PERSONAL

Mr. C. H. Tait, who, as announced in *THE RAILWAY GAZETTE* of March 9, has been appointed District Goods and Passenger Manager, South, West and Central Wales District, Swansea, L.M.S.R., joined the old L.N.W.R. in 1894. After experience in various phases of traffic working, he was appointed Assistant Superintendent for

Mr. M. J. Canny, General Superintendent of Transportation, has been appointed a Commissioner, Victorian Government Railways, in succession to Mr. T. B. Molomby, who retired from the service on December 31 last.

Mr. Molomby was born at Geelong in 1868 and joined the railways as a junior clerk there in 1883. He was transferred to the head office at Melbourne in 1892 and became Time

whom he now again succeeds, as Commissioner.

Mr. John Frame, founder of Frame's Tours Limited, left estate valued at £163,886 (£160,227 net).

Mr. Walter Pratt has retired from the position of General Manager, Canadian National Railways, Hotels & Dining Car system, after 50 years' service.



Mr. C. H. Tait,

Appointed District Goods and Passenger Manager, South, West and Central Wales District, L.M.S.R.



Mr. T. B. Molomby,

Commissioner, Victorian Government Railways, 1924-33



Mr. M. J. Canny,

Appointed Commissioner, Victorian Government Railways

the Chester District in 1904, and three years later became Assistant Goods Manager, London District. During the war he served as a Railway Transport Officer and also held a commission in the 17th King's Liverpool Regiment, being demobilised, after the return of the North Russia Expeditionary Force in 1919, with the rank of Captain. Mr. Tait was then appointed District Traffic Superintendent at Swansea, and in 1924 was promoted to be District Traffic Superintendent of the Abergavenny District, L.M.S.R. Now that the two districts have been combined he has, as from March 1, been placed in charge of it with the designation given above.

Mr. A. B. Richardson's term of office as Chief Mechanical Engineer, Emu Bay Railway, Tasmania, has been extended for a further five years. He is son of the late Mr. J. J. Richardson, M.V.O., sometime Locomotive Running Superintendent, L.B.S.C.R.

Mr. C. E. Straker, late Chairman of R. & W. Hawthorn Leslie & Co. Ltd., left estate valued at £77,155 (£76,153 net).

Tables Officer in 1905. Three years later he was promoted to be Superintendent of Passenger Train Service. In 1914 he accompanied Mr. E. B. Jones, Commissioner, on a visit to Europe and America to study electric working with a view to the electrification of the Melbourne suburban lines. Mr. Molomby was also a member of the Electrification Committee from its inception. In 1915 he was appointed General Superintendent of the Transportation Branch, and became a Commissioner in 1924.

Mr. Canny was born in 1882 and joined the Victorian railways as a junior goods messenger in 1897. After experience in the office of the Superintendent of Goods Train Service, he was transferred to the Secretary's Branch, and in 1904 was selected to be Personal Clerk to the Chairman of Commissioners. In 1919, Mr. Canny was appointed Outdoor Superintendent, Transportation Branch and in the following year visited America to study railway working there. In 1924 he was promoted to be Assistant General Superintendent, and later in that year became General Superintendent of Transportation in place of Mr. Molomby,

Born in Northamptonshire and educated at Stratford-on-Avon, he went to Canada and began his railway career in 1883 at the age of 14. His promotion was rapid and steadily maintained until he reached the head of his department.

We regret to record the death, on March 18—after a few months' illness, attended at first by much suffering—of Mr. F. W. May, in recent years an outdoor representative in London for the W. R. Sykes Interlocking Signal Company. In the service first of the late W. R. Sykes and then of the company for over forty years, Mr. May was well known to many members of the railway signal departments, especially on those sections of the line where the Sykes lock-and-block was in use. He was actively concerned in the original installation of this system on the Southern and old Great Eastern lines and was also engaged in installation work of other kinds for the Sykes Company. Mr. May, familiarly known as "Tommy," was fifty-eight years of age. He was much esteemed by those with whom he came in contact and will be greatly missed by his railway friends.

Lord Faringdon

It is with regret that we have to record the death, on March 17, at his residence in Arlington Street, in his 84th year, of Lord Faringdon, C.H., Deputy-Chairman of the London & North Eastern Railway Company. He had been ill since the middle of January. Born in London in 1850, Alexander Henderson was the second son of Mr. George Henderson, of Langholm, Dumfries, a distinguished Greek scholar. After being educated privately, he entered at the age of 17 the office of Messrs. Deloitte, Plender, Griffiths & Co., Chartered Accountants. His sound work and abilities attracted the attention of Mr. Thomas Greenwood, senior partner in the firm of Messrs. Greenwood & Co., stockbrokers, who had had some connection with the Great Western Railway, and young Henderson was taken into this firm. There he acquired a knowledge of railway finance which he afterwards turned to good account, eventually becoming the head of the firm, with which he remained associated all his life. He became a member of the Stock Exchange so long ago as 1873, and thus was one of the oldest members of the House. His firm was interested in the promotion and administration of large undertakings in Argentina and many other parts of the world, and had important railway interests in South America.

Mr. Henderson's first close connection with British railways came in 1894, when he was elected a Director of the Great Central Railway Company in order that it might have the full benefit of his skill as a financier in raising the large amount of capital necessary for its extension to London, which had been authorised by Parliament in the previous year. It was mainly owing to his ability and influence that this difficult operation was so successfully carried through. He was elected Chairman of the company in 1899 in succession to Lord Wharnccliffe. Shortly before Mr. Henderson became Chairman the extension to London had been opened in March, 1899, running powers being exercised over the Metropolitan Railway from Quainton Road to a point about 2 miles from the Marylebone terminus. The first great work of new railway construction to be completed during his chairmanship was a new access to London over the Great Western and Great Central Joint Line via High Wycombe which was opened in 1906, the joint line being by arrangement constructed by the Great Western. Disputes with the Metropolitan were settled in the same year, when the Great Central became joint owner of the northern extension of the Metropolitan Railway, except the Uxbridge branch. Access to new coalfields, better connections and shorter routes were obtained by the company's acquisition in 1907 of the Lancashire, Derbyshire & East Coast Railway. The great new dock at Immingham authorised in 1901 in the hands of the Humber Commercial Railway & Dock Company was opened in 1913 and leased in perpetuity to the Great Central. Thus, owing to the arrangements made by its Chairman, the Great Central was, without any fresh capital expenditure, given the charge of a magnificent new property which greatly increased the value of the whole undertaking. Competition with the Great Central's former ally, the Great Northern, and with the Great

Eastern, was greatly modified from 1908 onwards by working arrangements between the three companies. The company's policy had become one of development and improvement of its own system, and of co-operation with other companies rather than further extension.

Mr. Henderson was created a baronet in 1902, and in 1916 was raised to the peerage, taking the title of Lord Faringdon. This title was chosen because of the nearness of the town of Faringdon to Lord Faringdon's country seat at Buscot, in Berkshire. He also owned a Scottish seat, Glenalmond House, Perthshire. In 1917 he was created a Companion of Honour, being one of the earliest recipients of that new Order, which had been instituted by the King in that year in recognition of services rendered both by British subjects and their allies in connection with the war. During the war period he gave much help to the Government, and launched the British Trade Corporation, of which he became Chairman; he was also Vice-Chairman of the Shipping Control Committee. Later, in 1921, he was appointed a member of the Advisory Committee on National Finance. Lord Faringdon maintained an active interest in politics. From 1898 to 1906 he was Member of Parliament for West Stafford, and from 1913 to 1916 for St. George's, Hanover Square. He was keenly interested in tariffs and was a member of the Tariff Commission appointed in 1904. Lord Faringdon remained Chairman of the Great Central Railway Company until December 31, 1922, and in the following year was elected Deputy-Chairman of the London & North Eastern Railway Company. He was presented on June 20, 1924, by Great Central Railway stockholders with his portrait painted by Sir William Orpen, R.A., in recognition of the



Elliott

[© Fry

The Late Lord Faringdon,

Deputy Chairman, L.N.E.R., 1923-34, and Chairman, G.C.R., 1899-1922

great services he had rendered to that company. As a railway director he was untiring in attention to his duties, and at the annual meeting of the L.N.E.R. Company on March 2 this year, Mr. William Whitelaw, in expressing his regret at Lord Faringdon's absence through illness, said that he believed that this was the first time that Lord Faringdon had not been present at the meetings of his railway shareholders throughout the long period of forty years. Lord Faringdon was also a member of the Cheshire Lines Committee, Chairman of the Sheffield & South Yorkshire Navigation Company, and a Director of the Anglo-International Bank Limited.

The funeral on Tuesday was private, and on Wednesday a service was held at St. James's Church, Piccadilly. A memorial service will also be held at St. Michael's Church, Cornhill, at 12.15 p.m. to day (Friday).

An Appreciation

Mr. William Whitelaw, Chairman of the London & North Eastern Railway Company, writes the following appreciation:—

There is difficulty in realising just at the moment how great is the loss which the railway companies have experienced in the death of Lord Faringdon. The London & North Eastern Company is of course the chief sufferer, but his far-

seeing vision at times of great importance to the railway industry was often of the greatest value. A few words of advice from him were worth half a dozen speeches from other people, and probably there never was anyone who could say so much in so few words.

Throughout his railway life he was always struggling with difficulties. Called to the Chairmanship of the Great Central Company at the nadir of its fortunes, he at once secured the confidence of the stockholders and gradually pulled it out of the slough of despond until at the date of the amalgamation there was looming up the prospect of a dividend on the preferred ordinary stock. The amalgamation hid to no small extent the result of Lord Faringdon's work for the Great Central Company, as its growing business was lost to sight in the figures of the amalgamated company. The construction of the great dock at Immingham was one of the outstanding achievements of his chairmanship, and that his life has not been prolonged to see the completion of the new

dock at Grimsby—another of his children—will be a source of the most profound regret to the people of that great port.

Since the amalgamation of the companies, Lord Faringdon has guided and controlled the whole finance of the London & North Eastern Company, and his unique financial experience cannot be replaced. To him age meant nothing; his mind was as alert and his advice as valuable up to a week or two ago as throughout his career. In the middle of February he discussed the Review of the Company's business for 1933 with all his old zest, and in the last week of the month the draft of the Chairman's speech was read to him and he wrote with his own hand the kindest of letters with his views upon it. It may be truly said that he died, as he wished, in harness.

His memory will ever be treasured by his colleagues with the profoundest respect and the warmest affection.

WM. WHITELAW

The English Channel Train Ferry Service

Southern Railway Channel train ferry launched—New sleeping cars for London-Paris service

To give an order for three sister ships to be built at once is very rare, especially so in present circumstances, but that is what the Southern Railway did as soon as the decision was reached to operate a train ferry service across the English Channel. The first of these ships, the *Twickenham Ferry*, was, as we recorded last week, launched on Thursday, March 15, at Newcastle-on-Tyne, as illustrated on page 498. They are twin-screw vessels, turbine driven and, in common with usual cross-channel practice, are fitted with a low rudder for ease of manoeuvring in harbour.

Although sea-going vessels, these are primarily ferry boats and are appropriately named after three famous Thames ferries, Twickenham ferry, Hampton ferry, and Shepperton ferry, all served by the Southern Railway. While the primary object is to carry trains of either goods or passengers, with the elimination of craning at ports and its consequent delay and greater risk of damage, yet the new ships will have promenade decks and saloon and cabin accommodation for passengers.

As the tides on each side of the Channel have a daily rise and fall of between 10 and 20 ft., an inclined slip was out of the question in this case owing to the necessity of having a gradient suitable for railway operation. The alternative of locks which would enable the vessels to link up with the shores on level terms at any state of the tide was therefore adopted, and these locks are now being built at Dover and Dunkirk, thus determining the route of the ferries.

The ships are being built in the Neptune yard at Walker-on-Tyne of Swan, Hunter & Wigham Richardson Limited, and the machinery is being supplied from the Turbinia works of the Parsons Marine Steam Turbine Co. Ltd., the boilers fitted with automatic Taylor stokers from the Clyde shops of Yarrow & Co. Ltd. Examination

of the various possible schemes for propelling these vessels showed the great advantages of coal as fuel when full use was made of automatic stokers, water-tube boilers and steam turbines, particularly as the coal can be run on board the ships direct in railway wagons, and tipped into the ships' bunkers, without having been handled since leaving the collieries.

To accommodate 12 sleeping cars, or 40 goods wagons, four lines of rails are provided on the train deck, converging to two at the stern, where land connection will be made by means of a drawbridge at the end of the dock. On the deck above the train deck there will be passenger accommodation, including lounges, cabins and restaurants. A garage for 25 cars, isolated so that they need not have their petrol tanks emptied, is to be provided on the after end of the upper deck, and it will be possible for motor road vehicles to use the train deck, the surface between the rails being made level for the purpose.

The harbour conditions of the Channel ports restrict the extreme length to 360 ft., while certain considerations as to the possible use of the vessel limit the draught of water when ordinarily loaded to 12 ft. 6 in. The depth from keel to train deck is 20 ft. and the height of the train deck space 15 ft. 6 in. The width is about 60 ft. The speed of the vessels on normal services will average 15 knots, but they should be capable of obtaining over 16½ knots if required.

At a luncheon given by the builders at the Royal Station Hotel, Newcastle-on-Tyne, prior to the launch, Mr. J. Denham Christie, Chairman of Swan, Hunter & Wigham Richardson Limited, presided. In proposing the toast "Success to the tss. *Twickenham Ferry* and her Owners," Mr. Christie expressed pleasure that the railways were at last on the way to recovery and wished that the same could be said

of shipbuilding. The order for the three train ferries had provided a considerable amount of work for men who would otherwise have been unemployed. Mr. Christie paid a tribute to Sir Westcott Abell, Professor of Naval Architecture at Armstrong College, who, as expert adviser to the Southern Railway, had supervised the design and building of the *Twickenham Ferry*.

Sir Francis H. Dent, a Director of the Southern Railway, in response to the toast, spoke of the decision to introduce train ferries as, to a certain extent, a leap in the dark, but he had every anticipation that it would turn out to have been justified. He hoped that in the days to come when the Southern Railway had an hourly service between London and Paris it would be possible again to order three ships at a time. Speaking of the skill of Tyne shipbuilders, he said that no ship had ever reflected more credit on the Tyne than the beautiful *Mauvretania*, which was a frequent visitor to Southampton.

Mr. Gilbert S. Szlumper, proposing the toast "The Shipbuilders," expressed pleasure at the presence of that doyen of British shipbuilders, Sir George Hunter. He regretted that the output from Swan, Hunter's shipyards had totalled only three vessels in 1933, and was glad the Southern Railway had been able to contribute to greater prosperity in 1934. He referred to other orders for new cruisers and destroyers which were on their way to the Tyne, a hopeful sign, he thought, that at last the Government was making an effort to recover the leeway in defensive armaments. He was, he said, no fire-eater, but he objected to the "nitwits and gasbags of Westminster sending gilded youths to Geneva" in order to try to end a method of settlement which had continued for 4,000 years. He thought that the days of Geneva planning would come to an end and that we might regret having allowed our protective forces to lag behind. Mr. G. F. Tweedy and the Lord Mayor of Newcastle (Councillor J. Leadbetter) responded.

Lady Dent afterwards performed the

christening ceremony at the Neptune yard, and, following the lunch, was presented with a sapphire and diamond brooch by Mr. Christie.

Among others present were the following:—

Messrs. R. P. Biddle, F. A. Brant, C. Cooper, D. Campbell, G. Elson, C. Grasemann, Captain Jeffries, Messrs. R. E. L. Maunsell, E. J. Missenden, D. McQueen, R. M. T. Richards, G. R. Walter, and F. J. Wymer (*Southern Railway*); M. Latrasse (*Northern Railway of France*); M. Broquaire (*Director of the Port of Dunkirk*); MM. Paul Jokelson and François Javary (*A.L.A.*); M. F. Woytt (*International Sleeping Car Company*); Sir G. B. Hunter, Mr. T. Morrison, Col. E. W. R. Pinkney, Messrs. G. B. Richardson and C. S. Swan (*Swan, Hunter & Wigham Richardson Limited*); Mr. R. J. Walker (*Parsons Marine Steam Turbine Co. Ltd.*); Sir Harold Yarrow (*Yarrow & Co. Ltd.*); and Sir Westcott S. Abell, Professor T. B. Abell, Mr. T. W. D. Abell, Eng. Com. S. O. Frew, Messrs. E. H. Mitchell, J. L. Scott and Zimmer.

Sleeping Cars for the Ferry Service

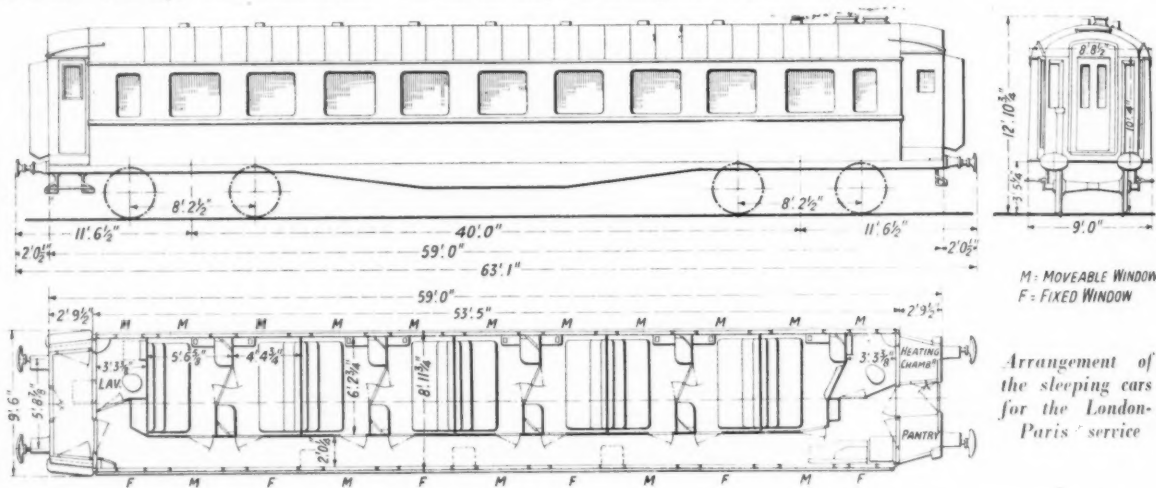
Following agreements arrived at with the Chemin de fer du Nord and the Southern Railway, the International

Sleeping Car Company is to introduce next year a through sleeping car service between Paris and London via the Dunkirk-Dover train ferry.

The type of car designed for this new service is generally similar to the all-metal sleepers built on the Continent during the last few years. Various modifications have had to be made however, owing to the restricted loading gauge of the Dover-London line, as compared with that on the French side, in order to provide for the maximum carrying capacity compatible with comfort. With this in view, the compartment housing the heating-water boiler, which is indispensable in vehicles of this type in order to supply warmth to the compartments when a locomotive is not attached to provide steam, and a service compartment for making tea or coffee, have been provided on one of the platforms, access from the line being at the other end of the car only, an arrangement which

has allowed for nine compartments of dimensions approximating closely to those of the sleepers now running on the Continent. Each compartment has two berths and provides either first or second class accommodation. The first class passenger has a compartment to himself, while for second class purposes two passengers are accommodated in each.

Special arrangements have been made to ensure the maximum comfort and safety for passengers during the crossing. In particular, the design of the beds gives the first-class passenger more room than heretofore. The anchoring of the cars on the ferry-boat has been the subject of the closest study in order to ensure that the action of the springs shall not amplify the motion of the vessel and that the occupants of the sleepers shall enjoy conditions comparable to those of an ordinary cabin. Each car weighs 47½ tons.



Funeral of Mr. Frank Tatlow

The funeral of Mr. Frank Tatlow, formerly General Manager of the Midland Railway, and until his death a Member of the Northern Counties Committee of the London Midland & Scottish Railway and Cheshire Lines Committee, whose passing was recorded in last week's issue, took place at Duffield Cemetery on Friday, March 16. Members of the Duffield Church choir preceded the cortege from the house to the cemetery, and the services were conducted by the Vicar of Duffield, Dr. W. M. Irwin.

In addition to family mourners, the London Midland & Scottish Railway were represented by: Sir Guy Granet, G.B.E., late General Manager and Chairman of the Midland Railway, and late Chairman of the L.M.S.R., of which he is a director; Sir Josiah Stamp, G.B.E., Chairman and President, L.M.S.R., represented by the Assistant Secretary, Mr. G. Royde Smith; Mr. Charles Booth, Director, L.M.S.R. (formerly Chairman, Midland Railway); Mr. H. V. Mosley, Chief Executive Officer for New Works

and Parliamentary Business, L.M.S.R. (formerly Assistant General Manager, Midland Railway); Mr. A. E. Towle, C.B.E., Controller, L.M.S. Hotel Services (formerly Manager, Midland Railway Hotel Services), represented by Mr. Geoffrey Towle, Controller's Assistant (Out-door), L.M.S. Hotel Services; Mr. E. Taylor, Chief Accountant, L.M.S.R. (formerly Chief Clerk, Accountant's Department, Midland Railway); Mr. S. J. Symes, Chief Stores Superintendent, L.M.S.R. (formerly Chief Loco. Draughtsman, Midland Railway); Mr. J. Sayers, Consulting Electrical Engineer, L.M.S.R. (formerly Telegraph Superintendent, Midland Railway); Mr. J. H. Follows, C.B.E., late Vice-President, L.M.S.R. (formerly General Superintendent, Midland Railway); Mr. J. Dalziel, Assistant Electrical Engineer.

The Northern Counties Committee of the L.M.S.R. was represented by: Lt.-Col. the Rt. Hon. Viscount Massereene and Ferrard, D.S.O., Director, Northern Counties Committee (formerly Director of Northern Counties Section of Midland Railway); Mr. Thomas Somerset, M.P., Director, Northern Counties Committee; Mr. F. L. Smith, Accountant, Northern Counties Committee, representing Officers and Staff of N.C.C. Major Malcolm Speir was unavoidably unable to be present owing to illness.

Amongst others present (or represented) were: Sir Henry Fowler, K.B.E., formerly Chief Mechanical Engineer, L.M.S.R.; Sir Francis Dent, Director, Southern Railway; Sir Felix J. C. Pole (formerly General Manager, Great Western Railway), Chairman, Associated Electrical Industries Limited; Mr. Joseph Cranham, late Secretary, Midland & Great Northern Joint Committee; Mr. E. R. Bullough, late Personal Assistant to General Manager of former Midland Railway; Mr. J. A. Kay, Editor, THE RAILWAY GAZETTE; Mr. K. C. Marrian, Engineer, Cheshire Lines Committee, Liverpool; Mr. R. B. Walker, Traffic Manager, Midland & Great Northern Joint Committee, King's Lynn; Mr. Frederick Ruffell, representing the Retired Railway Officers' Society; Sir John Ferguson Bell; Mr. Andrew Hingley, Vice-Chairman of Duffield Parish Council; Mr. Fred Swire; Mr. J. B. Hill; Mr. E. Reed, representing Carpet Trades Limited; Mr. A. Leslie Wing (Sheffield); Mr. J. G. Gough, late Stationmaster at Duffield; Mr. F. C. Treadgold; Mr. D. N. Turner, Manager, Staveley Coal & Iron Company; Mr. J. Hunter, General Manager, Staveley Coal & Iron Company; Mr. H. Staveley Coal & Iron Company; Mr. H. Beresford, Commercial Manager, Staveley Coal & Iron Company; Dr. Gordon Morrison; Mr. F. Fox; Mr. Nowell V. C. Turner (London); Mr. W. Hutton-Howlett, General Manager and Director, G. R. Turner Limited; Mr. R. Bingham, representing the New Hucknall Colliery Limited.

United Kingdom Railway Officers' and Servants' Association

The Right Hon. the Earl of Radnor presided at the 73rd Anniversary Festival Dinner of the Railway Officers' and Servants' Association, at the Trocadero, on March 15.

Among those present were:—

Lord Ebbisham, Earl Poulett, Sir Robert Horne, Brig.-Gen. Hammond, Lt.-Col. Brooke-Hitching, Majors G. E. Thompson, F. H. Millman, E. J. Burt, Hon. Richard G. Lytton, Dr. C. G. McMahon, Messrs. Charles Sheath, W. T. Monckton, W. Craven Ellis, W. Bishop, Ralph Cope, Lionel Kitson, Leslie Boyce, A. D. Jones, A. E. Kirkus, F. R. E. Davis, C. W. Edwards, J. A. Kay, H. J. Chivers, R. C. Fletcher, F. K. Potter, C. H. Barfoot, Percy Syder, H. A. Alexander, F. C. Wilson (Deputy Chairman of the Association), G. F. Lofting, H. Hall, R. R. Pettit, H. W. C. Drury, J. S. Wilson, A. E. Moore, R. G. Davidson, A. Howie, H. F. Sanderson, S. A. V. Gregory, L. P. Parker, R. Gardiner, A. E. Smith, W. Eaves, G. Keary (Treasurer) and A. Jones (Secretary).

Lord Radnor proposed the toast of "Prosperity to the Association." In commending it to his hearers' generosity, he explained that the association existed mainly to help needy railwaymen and their families. Not that it was entirely a charitable institution, because members pay a small subscription and have a prior claim to consideration. Nevertheless, it depends principally upon the subscriptions of those interested in it. Explaining the work the association accomplished, he said that its members can look forward to annuities, and grants are also made in really deserving cases. To give some idea of the scope of its activities, Lord Radnor remarked that there were 585 annuitants on the books and on these £100,000 had been spent. Meanwhile the total expended upon assistance to railwaymen generally since the formation of the association 73 years ago amounted to £341,000, a figure of which they might all feel proud.

Without wishing to mention controversial subjects, the chairman said he could not help calling attention to the marked prominence given to railway as opposed to road accidents in the press, a fact which was a great compliment to railways and railwaymen. The public owed a heavy debt of gratitude to the care and attention to duty and to details paid by railway employees to secure immunity from accidents for their companies, but railwaymen themselves had to take risks which were not generally realised and their lives were not so safe as was generally imagined. In 1932, for instance, 202 lost their lives and 14,950 were injured. Small though the casualties among railway employees were as compared with the toll of the road, they were, he claimed, ample justification for the existence of an institution such as the Railway Officers' and Servants' Association, which helped in cases not touched by State or railway companies' pensions and funds. Of this fact he gave an eloquent example. In all some £3,000 were dis-

bursed last year and unfortunately, due to hard times and to the deaths of former liberal subscribers, income was falling and there were at the moment 34 unsuccessful, though deserving, applicants for annuities. He therefore appealed for funds which were urgently needed, and in proposing the toast of "The Association" coupled with it the name of Mr. F. C. Wilson, its Deputy Chairman, in the absence, due to ill-health, of the Chairman.

Mr. Wilson, in replying to the toast, placed a number of cases of benefits bestowed by the association before his hearers and pointed out that all eligible cases were, as far as possible, assisted.

Mr. Walter T. Monckton, M.C., K.C., in a witty speech, proposed the health of the visitors, coupled with the name of Sir Robert Horne, who, he pointed out, had risen from a mere Chancellor of the Exchequer to be a railway chairman.

Sir Robert's reply took the form of another amusing speech full of anecdote. He asked his hearers to believe

that he was abashed at being the only chairman of a railway present, but he pointed out that chairmen were very busy men and for good reasons the others could not be present. For instance, Mr. Loder was sitting at Brighton counting electrified passengers, Mr. Whitelaw was hard at it loading coal, and Sir Josiah Stamp was at Carlisle settling a dispute between a Scotsman and an Englishman, the latter having finally called the former a Loch Ness monster. Sir Robert concluded by thanking the association for the warm welcome he and his fellow visitors had been accorded.

The Secretary, Mr. A. James, announced that the total subscribed was £776, which, together with sums collected by stationmasters and others, amounted to £1,250 in all or £50 more than last year.

Lord Ebbisham proposed the toast of "Lord Radnor," the chairman, whose career and work, both as a member of the Southern Railway Board and in helping the association, he extolled. He also said how glad they were to have Sir Robert Horne there as a visitor and also as a railway chairman, with his unrivalled experience of both business and politics.

Southern Railway Pupils and Premium Apprentices Association Annual Dinner

The ninth annual dinner of the Southern Railway Pupils and Premium Apprentices Association was held at the Charing Cross Hotel, London, on Friday, March 16. Following the loyal toast, the toast of "Our Guests" was proposed by the chairman, Mr. L. F. Aitken, and in his response Mr. E. Chard recalled his own early days of service on the Somerset & Dorset Joint Railway. Mr. H. B. West proposed the toast of "The Chief Mechanical Engineer of the Southern Railway."

Mr. R. E. L. Maunsell, responding, expressed his pleasure at seeing so many both serving and old premiums and pupils present. In the course of his speech, he referred to the continued fight of the steam locomotive against the internal combustion engine, and mentioned the experiments which were being carried out with diesel, diesel-electric and other internal combustion engines for main-line services and also for use in various types of railcars. He also dealt with the question of all-steel coaches, and concluded by emphasising to the younger men the need for the maximum of efficiency in these days when so few jobs in the locomotive engineering profession were offering.

Mr. G. White proposed the toast of "The Southern Railway," and Mr. C. E. Cox, Traffic Manager, Southern Railway, in his reply, recalled his early days in the service of the South Eastern Railway, at a time when some of the third class coaches had no windows and there was no steam heating. He

referred to the progressive policy which the Southern Railway directors had pursued since the grouping. To-day, they continued to look ahead determined that if transport was to be provided they would share in it, whether by rail, road or air. Last year's results had been much more satisfactory than those of the previous year, but they realised that there were other forms of transport in the field, and the railways had to search and plead for business to-day and could secure it only by doing better than anyone else. Railways to-day were essential to the life of the nation. Daily the Southern Railway brought into and took out of London half a million passengers. The problem of finding a light unit suitable for all conditions of branch line service was as yet unsolved. On some lines the light railbus could do all that was necessary. Such vehicles would not serve on others except as a supplementary measure. The railways were common carriers and on some lines they had few passengers but a miscellany of produce and other things to move on occasion. They had yet to see the vehicle which was adaptable to all the varied requirements of this traffic.

Mr. J. Kenneth Taylor, chairman of the committee responsible for organising the dinner, reported on the year's progress and paid tribute to the work of Messrs. Forge, Cornfoot and Aitken, his colleagues on the committee, in arranging the dinner.

Centralised Traffic Control

At a meeting of the Institution of Railway Signal Engineers on Wednesday, March 14, the President, Mr. R. S. Griffiths, announced that the annual summer meeting would probably be held at Cardiff on June 14, 15, and 16. A paper was then read by Major L. H. Peter, on the above named subject, of which the following is a summary.

Opinion in the United States as to the value of C.T.C., of which there are 63 installations, is well summarised in Chapter III of "Principles and Economic Phase of Signalling," published by the Signal Section, A.R.A., wherein the following are quoted as some of its advantages:—

- 1.—Increases safety of train operation.
- 2.—Reduces train stops, meeting and passing trains.
- 3.—Increases freight train average speed and decreases freight train hours.
- 4.—In many cases permits increased train loading because of removing restriction imposed by grades at entrance points to sidings due to power operation of switches or because elimination of delays permits greater loading and maintenance of schedules.
- 5.—Provides greater productivity in gross ton miles per train hour, because of increased speed and tonnage.
- 6.—Reduces written train orders.
- 7.—Reduces cost of operation.
- 8.—Provides increased track capacity and a greater utilisation of existing facilities, thereby conserving capital which would otherwise be required for more costly methods of increasing the capacity of the railway.
- 9.—Provides facilities for instantly directing train movements as required.

Of these, 3, 7, 8 and 9 are those which most interest us in this country and under present conditions (7) is the most important factor. The manner in which operating costs will be reduced by the introduction of C.T.C. is well known to all those who have experience of the savings resulting from closing signal-boxes and introducing remote control of points and signals. In the case of C.T.C., these savings will be in the same direction but on a magnified scale.

There are so many cases where C.T.C. could justifiably facilitate transport that the listing of all of them would be outside the limits of this paper. Instead of putting forward such a list, let us keep the whole question as broad as possible in order that all may resolve for themselves the direct applications of this new development to their own problems. At the same time, the author takes this opportunity of drawing attention to one point often forgotten, namely, that at night, many of the traffic lanes leading to the railway highroads which join our cities are shut down by a process which technicians call "switching out." This term "switching out" really means "gone to sleep." The direct result of this is that the carrier, in this case a goods train, must pass the door of the sleeping merchant. Why should he? With C.T.C., the carrier would call, drop his goods and leave—always under the watchful eye of the C.T.C. operator. This process is reversible

and the carrier may well be picking up new traffic instead of dropping it, as in this example. Why should any customer that the carrier can get be told that he must have his load ready for the traffic stream at a definite hour? If the carrier has signalled his traffic lanes on the C.T.C. system, he will be ready and willing to say "I will collect or deliver any load at any time."

Suppose that a private road haulier parks a road vehicle with a paying load at a roadside garage and wants it out at an hour when the garage owner has gone home, will that haulier be satisfied to wait until the garage is opened next day? In some cases railway companies are routing night goods trains by longer routes, because the cabins on the direct route are not staffed at night. With C.T.C. as the basis of our traffic working, there would be little difficulty in meeting a corresponding case on our railways.

The system of telephone order train control which exists on our railways to-day provides communication channels through which information is given and traffic movements arranged to suit. A C.T.C. system aims at more than this, but does not supersede the information channels which, in fact, become even more necessary.

The President, in his address this year, indicated that the interlocking machine would always remain, but the author feels that the duty of these machines is changing and that in future they will be regarded as traffic control machines and will cease to be equipped with interlocking. All interlocking will move away from the control machine and become associated with the apparatus controlled, and in all probability this in turn will lead to the control levers being used more for

directional and routing purposes than for the individual operation of points and signals. When we regard the control machine as such, it becomes apparent that it should, where possible, be located in the same office as the traffic controller, and no time will then be wasted in translating from the communication system on to the traffic control system. It will become the practice to use all lines for traffic in either direction according to the traffic flow of the moment, and it will be for the traffic operator to work out schedules vastly different from the time-table type used to-day. This may be looking some way ahead, but here is a new tool placed ready to the hand of signal engineers, and they will doubtless use it to fashion a new traffic handling method.

From a broadly technical point of view, the centralising of the control of a number of distant functions is now recognised good practice in many branches of engineering. The remote control of unattended sub-stations and of boiler rooms and pumping stations are a few examples of this work.

It has been suggested that centralised traffic control is a system which is primarily suitable for operating single lines with passing loops or districts with infrequent traffic, but this is an entirely wrong conception.

The following took part in the subsequent discussion:—

Messrs. F. Downes, R. Gardiner, I. E. Sharpe, W. Challis, C. Carlisle, H. H. Dyer, B. F. Wagenrieder, J. Boot, H. M. Proud and G. H. Crook.

A communication from Monsieur Paul Prache, on the installation between Houilles and Sartrouville on the French State Railways, was read. In closing the meeting the President said that the Institution might be able to arrange a visit to the installation at Wembley Park.

Forthcoming Events

- Mar. 23 (Fri.).—L.N.E.R. Musical Society, at Hamilton Hall, Liverpool Street, London, E.C.2. Bohemian Concert.
- Mar. 24 (Sat.).—L.N.E.R. (Great Central) Lecture and Debating Society, at University College, Shakespeare Street, Nottingham, 5 p.m. "Road Motor Services in the North-Eastern Area," by Mr. A. A. Harrison.
- Mar. 27 (Tues.).—Institute of Transport (Scottish), at Royal British Hotel, Princes Street, Edinburgh. Visit of the President.
- Great Eastern A.A.A., at Hamilton Hall, Liverpool Street, London, E.C.2, 6.30 p.m. Boxing Championships.
- Mar. 29 (Thurs.).—Railway Students' Association (Edinburgh), at North British Station Hotel, 7 p.m. Annual Supper.
- Apr. 5 (Thurs.).—Stephenson Locomotive Society, at King's Cross Station (L.N.E.R.), London, N.1, 6.30 p.m. "From Works Apprentice to Shed Superintendent," by Mr. B. Adkinson.
- Apr. 6 (Fri.).—Institute of Transport (Leeds), at Town Hall, 6.30 p.m. Annual General Meeting.
- Institution of Mechanical Engineers, Storey's Gate, London, S.W.1., 7 p.m. Informal Meeting.
- Apr. 7 (Sat.).—Locomotivemen's Craft Guild (London), at Borough Polytechnic Inst.,

- S.E.1., 6.30 p.m. "Safety on the Railways."
- Apr. 10 (Tues.).—Institute of Transport (Birmingham), at Queen's Hotel, 6 p.m. Annual General Meeting.
- Retired Railway Officers' Society, in Room 300, Great Eastern Hotel, Liverpool Street, London, E.C.2, 2.30 p.m. Ordinary Meeting.
- Apr. 11 (Wed.).—Permanent Way Institution (London), in Staff Dining Room, Waterloo Station (S.R.), 7 p.m. "Engineering Problems in Fensland," by Mr. B. P. Fletcher.
- Apr. 12 (Thurs.).—Institute of Metals (London), at Society of Motor Manufacturers and Traders Limited, 83, Pall Mall, S.W.1, 7.30 p.m. Annual General Meeting.
- Apr. 13 (Fri.).—Institute of Transport (Newcastle), at Royal Station Hotel, 7.30 p.m. Annual General Meeting.
- Passenger Transport Policy," by Mr. C. A. Hopkins.
- Railway Club, 57, Fetter Lane, London, E.C.4, 7.30 p.m. "The London Chatham & Dover Railway," by Mr. C. N. Anderson.
- Apr. 14 (Sat.).—Permanent Way Institution (Manchester—Liverpool), at Temperance (Manchester—Liverpool), at Temperance Inst., Southport, 3 p.m. "The Work of a Bridge Repair Gang," by Mr. R. D. Gauld.
- Apr. 16 (Mon.).—Wimbledon Locomotive Club, Wimbledon Hill, London, S.W.19. "Railways of the Irish Free State," by Mr. A. W. Croughton.

RAILWAY AND OTHER MEETINGS

CONSOLIDATED MINES SELECTION CO. LTD.

The 38th ordinary general meeting of the Consolidated Mines Selection Co. Ltd. was held on Thursday, March 15, at River Plate House, Finsbury Circus, E.C., Mr. Walter McDermott (Chairman of the company) presiding.

The Secretary (Mr. F. A. Rogers) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said the capital position of the company was unchanged from that of several years past; there were 1,200,000 ordinary shares of 10s. each issued, all fully paid, and there were no preference shares or debentures. He was able to tell the meeting in April, 1933, that the balance-sheet of December 31, 1932, was no longer of any value as a guide to the financial position of the company, for the depreciation in the market value of their assets at the end of the year had entirely disappeared by the beginning of April, and some profits had been already realised in the first three months of the new year. For the remainder of 1933 there was a continued improvement in the mining industry and a steady revival of enterprise in the starting of new mining investments which had been impossible for several years. The change in the whole industrial and financial atmosphere had been brought about by a variety of world conditions, but chiefly by the extraordinary increase in the market valuation of gold as a metal, which had introduced a new element into the complicated problem of international commerce and trading.

It would be useful to anticipate a criticism by some members present of the proposed application of £80,000 from the year's profit to a reserve account. It might be the opinion of some shareholders that, after several hungry years, it would be a more satisfactory proceeding to pay a larger dividend and make less provision in the way of reserve for future contingencies. That reasonable view had been fully considered by the directors, but they decided that the long and varied experiences of the past and the impossibility of foreseeing the results of operations even one year ahead made it very desirable to return to the habit of the past of building up a reserve against contingencies.

In considering the whole financial position of the company as set forth in the balance-sheet at the end of 1933, it would be seen that the cash, cash assets and book value of investments exceeded the aggregate of the total share capital and all creditor accounts by the sum of £153,475. The actual position was better than those figures indicated, because the book value of

£543,664 taken for the shareholding investments was considerably lower than the market quotations and directors' valuation of unquoted holdings at December 31, 1933.

Dealing with the company's Anglo-American Corporation holding, the Chairman observed that there was every prospect, now that arrangements for the close co-operation of all producers and the Government of South Africa had been concluded, that the diamond business, which had been showing signs of recovery, would improve.

In looking forward at the prospects of their own company in the current

year they had already been able to obtain certain participations in new issues, such as increases of capital of East Daggafontein Mines Limited, Vogelstruisbult Gold Mining Areas Limited, and East Rand Gold, Coal & Estate Co. Ltd., which, in the existing more cheerful markets, were likely to give openings for realisation of profits, and they were in a financial position to take a hand in new enterprises to which they might look forward. Shareholders would probably agree that, in the matter of general confidence, on which industry and commerce and speculation depended, the atmosphere was decidedly better in this country than it had been for several years past.

The resolution was unanimously adopted.

RAILWAY AND OTHER REPORTS

Bengal Doonars Railway.—A dividend of 3 per cent. on the ordinary capital will be payable (less tax at 2s. 7½d. in the £) on April 20. This distribution is the same as that of a year ago.

British Insulated Cables Limited.

—The profit for 1933 is £517,000, against £589,000 for 1932. Allocations to reserves and depreciation amount to £160,000, against £220,000 for 1932. A final dividend of 10 per cent. is recommended, making 15 per cent. for the year, the same as for 1932.

Cammell Laird & Co. Ltd.

—The accounts for the year to December 31 last show a net profit, after charging depreciation, of £31,876. This, with the amount brought forward of £741, enables interest at the rate of 2½ per cent. to be paid on the first and third debenture stocks on May 1. A credit balance of £3,005 will be carried forward. The second debentures were redeemed during the year. The net profit for 1932 was £626. No interest was paid for that year on the first and third debenture stocks.

Southport & Cheshire Lines Extension Railway.

—The report and accounts for the year ended December 31, 1933, show gross receipts, after adjustment, (including amount payable by the London Midland & Scottish Railway Company for the year ended June 30, 1933, in respect of the Lancashire & Yorkshire Railway guarantee of traffic) of £19,284, and a balance carried to net revenue account of £7,484, as compared with £7,424 for the corresponding period of 1932. The net revenue account, including balance of £946 brought forward from the previous year, shows, after payment of the debenture dividend, a balance of £2,675. Out of this the directors recommend a payment of 2 per cent. for the year on the 2½ per cent. preference stock—the same as for the previous year—leaving £1,175 to be carried forward.

Trent Motor Traction Co. Ltd.

—Revenue for 1933 was £394,655, compared with £406,107 for the previous year, and the net profit after placing £46,665 to depreciation was £28,932. The sum of £5,000 is appropriated to reserve, and the dividend is maintained at 10 per cent., £16,418 being carried forward, as against £19,295 brought in. The company has acquired the businesses of three omnibus proprietors operating in the district.

Sentinel Waggon Works Limited.

—The accounts for 1933 show a loss of £26,219, against £7,072 for the previous year. After providing for depreciation, &c., and deducting the £325 brought in, a debit balance of £45,100 remains. The directors announce the introduction of a new model (S.) of steam wagon, with the result of numerous orders being received for road wagons. Orders in hand at December 31 and inquiries since received indicate a prospect of continued increase in business.

North British Locomotive Co. Ltd.

—The annual report for the year 1933 states that the locomotive industry still continues to suffer from severe depression, notwithstanding the placing recently of important contracts for locomotives by the London Midland & Scottish and the London & North-Eastern Railway Companies at extremely low prices. While there was a substantial loss on trading this was modified considerably by gains which accrued from interest and from realisation of investments. The balance brought forward from the previous year was £2,895. From this is deducted loss for the year, £2,661, leaving a credit of £234. The directors have transferred from reserve the sum of £15,000. It is proposed to pay 2½ per cent. dividend on the 5 per cent. preference shares, leaving £1,172 to be carried forward. Operations in the previous year, after providing for depreciation, yielded a profit of £15,557, and the full 5 per cent. payment was made on the preference shares.

BRITISH RAILWAY STATISTICS

"The Railway Gazette" monthly table of freight and passenger traffic figures for December, 1933, as compared with the corresponding period in 1932, compiled from the Ministry of Transport Statement No. 169

Description	Great Britain*	Great Western	London & North Eastern	London Midland & Scottish	Southern
PASSENGER TRAIN TRAFFIC—					
Number of passenger journeys (excluding season-ticket holders)	96,141,486	7,361,600	13,848,645	22,238,504	16,584,952
Increase (+) or decrease (—)	203,892	159,922	345,438	278,918	171,313
Passenger receipts (excluding season-ticket holders)	£3,921,485	£585,007	£783,178	£1,179,651	£846,513
Increase (+) or decrease (—)	£25,505	£6,197	£12,235	£1,962	£14,034
Season-ticket receipts	£702,956	£41,033	£122,254	£174,479	£238,225
Increase (+) or decrease (—)	£9,772	£2,518	£7,108	£1,656	£10,808
Parcels and miscellaneous traffic receipts (excluding parcels post)	£1,077,650	£191,047	£317,129	£407,723	£131,837
Increase (+) or decrease (—)	£4,069	£3,783	£6,382	£3,261	£4,594
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled)	22,071,279	4,862,130	10,379,964	10,244,609	1,441,041
Increase (+) or decrease (—)	1,743,642	234,666	1,105,170	905,461	133,065
Net ton-miles (excluding free-hauled)	1,202,096,716	207,667,155	417,867,530	488,080,317	54,132,092
Increase (+) or decrease (—)	100,326,680	17,144,465	41,122,028	35,821,937	3,150,486
Average length of haul (miles) (excluding free-hauled)	54.46	42.71	40.26	47.64	37.56
Increase (+) or decrease (—)	0.26	1.54	0.36	0.79	1.44
Freight traffic receipts	£6,677,440	£1,102,177	£2,244,010	£2,783,000	£366,793
Increase (+) or decrease (—)	£536,485	£109,931	£218,675	£200,758	£7,346
Receipts per ton-mile	1.336d.	1.27d.	1.29d.	1.35d.	1.63d.
Increase (+) or decrease (—)	0.005d.	+ 0.02d.			0.14d.
Freight train-loads—					
Average train-load (tons)	132.62	136.63	140.03	129.71	109.40
Increase (+) or decrease (—)	4.40	6.97	4.37	3.20	1.80
Net ton-miles—					
Per train engine-hour	919.95	995.92	977.04	873.45	799.19
Increase (+) or decrease (—)	78.24	20.58	56.39	122.77	36.16
Per shunting-hour	848.08	781.69	947.21	854.55	573.98
Per total engine-hour	441.28	437.95	480.95	431.92	334.06
Net ton-miles per route-mile per working day	2.869	2.664	3.166	3.367	1.233
Increase (+) or decrease (—)	348	334	425	374	123
Wagon-miles, Total	333,057,983	56,608,683	117,575,226	140,490,368	16,132,128
Increase (+) or decrease (—)	20,269,310	2,797,496	9,833,865	6,820,389	442,438
Percentage of loaded to total	66.61	67.75	64.10	68.38	65.87
Wagons per train—					
Total	34.62	34.45	35.31	34.74	31.29
Increase (+) or decrease (—)	0.43	0.46	0.66	0.31	0.34
Loaded	23.06	23.34	22.63	23.75	20.55
Empty	11.56	11.11	12.68	10.99	10.65
Train-miles, Coaching—					
Per train-hour	14.78	13.59	13.91	14.13	17.35
Per engine-hour	11.73	10.72	10.77	10.66	14.08
Train-miles, Freight—					
Per train-hour	8.13	8.78	8.14	7.79	9.02
Per engine-hour	3.33	3.22	3.47	3.32	3.00
Engine-miles, Total	43,250,613	6,678,407	12,040,886	16,027,131	5,703,945
Increase (+) or decrease (—)	1,550,884	132,786	501,737	588,445	190,326
Mileage run by engines, Total train-miles—					
Coaching	21,139,908	2,892,729	4,831,626	6,689,339	4,150,417
Freight	9,620,869	1,643,378	3,330,140	4,044,548	517,078
Engine-hours in traffic, Total	4,878,056	804,842	1,473,103	1,924,632	482,635
Increase (+) or decrease (—)	358,002	36,295	110,782	189,283	14,551
Shunting miles per 100 train-miles—					
Coaching	7.85	7.30	6.74	8.79	8.38
Freight	78.22	87.45	72.93	75.48	100.37

* All standard-gauge railways

Passenger Traffic Statistics: Number of Journeys, Receipts, and Receipts per Journey (excluding Season-Ticket Holders)—December, 1933

Subject	Great Britain	Great Western	London & North Eastern	London Midland & Scottish	Southern	Cheshire Lines Committee	Liverpool Overhead	London Passenger Transport Board†	Mersey
Full fares—									
Passenger journeys	32,379,517	765,397	1,322,598	1,743,268	2,988,047	26,345	150,194	24,379,544	133,035
Gross receipts	£890,042	£77,384	£117,388	£131,833	£196,174	£3,296	£1,622	£343,328	£2,208
Receipts per passenger journey	6.60d.	24.26d.	21.30d.	18.15d.	15.76d.	30.03d.	2.59d.	3.38d.	3.98d.
Reduced fares—									
Excursion and week-end—									
Passenger journeys	37,783,094	4,429,036	8,557,162	13,197,600	8,273,328	421,720	100,810	1,930,896	714,428
Gross receipts	£2,414,187	£403,996	£551,919	£877,483	£483,855	£26,063	£775	£22,634	£10,367
Receipts per passenger journey	15.33d.	21.89d.	15.48d.	15.96d.	14.04d.	14.83d.	1.85d.	5.27d.	3.48d.
Workmen—									
Passenger journeys	22,189,779	1,660,232	2,983,611	6,211,846	4,602,456	219,168	200,426	5,336,528	181,148
Gross receipts	£318,331	£23,952	£47,265	£97,312	£75,139	£7,738	£1,643	£58,296	£1,638
Receipts per passenger journey	3.44d.	3.46d.	3.80d.	3.76d.	3.92d.	4.09d.	1.97d.	2.62d.	2.17d.
Other descriptions—									
Passenger journeys	3,788,016	506,935	984,898	1,085,252	720,965	39,259	486	357,893	13,287
Gross receipts	£297,587	£59,675	£66,128	£72,333	£91,186	£2,472	£2	£2,687	£132
Receipts per passenger journey	18.85d.	28.25d.	16.11d.	16.00d.	30.35d.	15.11d.	0.99d.	1.80d.	2.38d.
Total—									
Passenger journeys	96,141,486	7,361,600	13,848,645	22,238,504	16,584,952	706,500	451,916	31,104,861	1,041,888
Gross receipts	£3,921,485	£565,007	£783,178	£1,179,651	£846,513	£35,578	£4,042	£426,945	£14,345
Receipts per passenger journey	9.79d.	18.42d.	13.57d.	12.73d.	12.25d.	12.09d.	2.15d.	3.29d.	3.30d.

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

NOTES AND NEWS

Cannock Chase Stations.—With a view to making clear which stations are most convenient for Cannock Chase, the designation "for Cannock Chase" is being officially added by the L.M.S.R. to the names of Milford and Brocton, and Hednesford stations, Staffordshire.

Wincham Light Railway.—The Minister of Transport has recently made the following Order:—The Wincham Light Railway Order, 1934, authorising the construction of a light railway in the parish of Wincham in the rural district of Northwich in the County Palatine of Chester.

Swiss Council to Promote Foreign Travel in Switzerland.—The Swiss National Council on March 16 adopted without discussion a decree granting a special credit of 1,500,000 francs (£93,750) to establish a Federal Council for the promotion of foreign touring in Switzerland by a reduction of fares during 1934-35.

Progress of Railway Bills.—The London Midland & Scottish Railway Bill and the Southern Railway Bill, which were read a second time in the House of Commons on February 5, have been committed to a Select Committee of that House, which is appointed to meet on Wednesday, April 11, under the chairmanship of Mr. Annesley Somerville. The London Midland & Scottish Railway Provisional Order (Scotland) is unopposed.

Closing Montrose L.M.S.R. Station.—April 29 has been fixed as the closing date of Montrose L.M.S.R. station. From the following day passenger traffic will be transferred to the Montrose station of the L.N.E.R., and in connection with the change over certain alterations are meantime being made at Broomfield Junction to provide the connecting link between the L.N.E. station at Montrose and Dubton Junction on the L.M.S.R. line. The L.M.S.R. will, however, continue to operate full wagon loads of goods, but smaller quantities will be dealt with by the L.N.E.R.

L.N.E.R. Essay Prizewinners.—The Federation of Railway Lecture and Debating Societies, North-Eastern Area, held its final meeting for the session on March 6. An address on "The Industrial Position of the North-Eastern Area" was delivered by Prof. H. M. Halls-worth, C.B.E., M.A., M.Com. of Armstrong College, Newcastle-on-Tyne. During the evening the chairman, Mr. T. Hornsby, Divisional General Manager, North-Eastern Area, announced the awards in the essay competition for the Chief General Manager's prize. The first prize was awarded to Mr. J. G. Foster, District Passenger Manager's Office, Newcastle, for his essay on "The Present Possibilities of Railway Participation in Air Transport in Great Britain." Mr. A. V. Ward, Passenger

Manager's Office, York, won the second prize with an essay on "Some Thoughts on Housing Development in Relation to Passenger Traffic." The prize in Section 2 of the competition was awarded to Mr. G. H. Waumsley, District Goods Manager's Office, Leeds, for an essay on "Railway Organisation, with special reference to the L.N.E.R."

Berlin-Moscow Air Service.—The German-Russian company known as Derulft has resumed the aeroplane service between Berlin, Königsberg, Kovno, and Moscow. In addition, German Luft Hansa planes fly every weekday between Berlin, Danzig, and Königsberg via Stettin.

Canadian National Railways and Supplementary Estimates.—Supplementary estimates totalling \$52,661,000 (over £10,500,000) for the fiscal year ended March 31, 1934, were introduced in the Canadian House of Commons, on March 19, by the Finance Minister. The main item of \$52,264,000 (about £10,453,000) covers the income deficit of the Canadian National Railways for the year 1933.

Applications and Decisions.—From the Licensing Authority for the East Midland Traffic Area we have received No. 1 of Applications and Decisions, the new official publication brought into being by the Road and Rail Traffic Act, 1933. It sets forth 38 applications for A, and 73 applications for B licences. The first public inquiry is to be held in the Grand Jury Room, Guildhall, Nottingham, on April 11, when 48 applications will be in the list for hearing.

The "Autocarrier" Service.—The Southern Railway motorcar ferry *Autocarrier* will run this year from Dover to Boulogne instead of Calais, thus reducing the road mileage between London and Paris by nearly 30 miles, the alteration taking effect from March 26. The schedule will be: Dover Marine dep. 11 a.m., Boulogne Maritime arr. 1 p.m. Boulogne Maritime dep. 2.30 p.m., Dover Marine arr. 4.30 p.m. Rates for cars are from 45s. 6d. according to wheel-base. A special cheap fare of 12s. 6d. (child 7s. 6d.) will be charged for passengers travelling with their cars on the *Autocarrier* between Dover and Boulogne.

G.W.R. Watch Testing.—An ingenious device, recently brought in use by the G.W.R. for testing watches prior to their issue to the staff, reproduces the various jolts and jars which watches receive in service, such as when a guard jumps down from his van to the ground. Every watch is subjected to a 15 minutes' test, during which time it receives 1,200 shocks. If at the end of this time it is found to be working correctly, it is passed for service. The device is composed of a small wooden tray, holding twelve watches, which is

fixed at one end while the other is rapidly jerked up and down by an electric motor. The apparatus has been designed and made at the G.W.R. works, Reading, and is claimed to be the only one of its kind in the world.

Metropolitan-Vickers Long-Service Association.—There are now no fewer than 1,045 members of the Metropolitan-Vickers Long-Service Association. The members include all grades of employees and staff who have completed over 20 years' service with the company. Sir Felix J. C. Pole, President of the Association, supported by directors and departmental officers, presided at the twelfth annual meeting and supper which was held in one of the canteens at the Trafford Park Works last Monday.

Death Sentences Following Moscow Railway Accident.—Death sentences were passed on the driver and fireman of the train involved in the collision near Moscow on March 4, in which 19 persons were reported killed and 52 injured. Three other officials accused of negligence were sentenced to various terms of imprisonment. We reported the accident briefly in our issue of March 9. Subsequent advices state that two coaches of a stationary train were badly smashed in a suburban station five miles from Moscow when an incoming train ran into it.

"Buy British" Exhibition Train.—We are informed that, as many exhibitors who have been approached have been unable to complete their arrangements in the short time available before March 14, the proposed starting date, the Advisory Committee of the first "Buy British" exhibition train, which includes representatives of the four railway companies, has decided to defer the date of commencement until September 12. The original programme for a three months' tour of England and Wales, with over 60 stopping places, will then be carried out, the tour ending at Birmingham on December 14.

The L.M.S.R. (London) Amateur Musical Society.—This Society's production of "Chu Chin Chow" at the New Scala Theatre last week was quite up to the standard of anything it has done during its long record—a record embracing the best of the Gilbert and Sullivan operas and other well-known plays. The story of this famous musical play of the East needs considerable skill in its interpretation, and its many changes of scene may, perhaps, be accounted something of a handicap where amateurs are concerned. But from first to last everything went with almost professional smoothness—thanks to the ripe experience of the players themselves, the stage direction of Mr. Arthur C. Chapman, and the fine work of Lloyd's Light Orchestra, under the conductorship (for this particular production) of Mr. Arthur Waller, A.R.C.M. The many charming vocal melodies which distinguish "Chu Chin Chow" were delightfully rendered and the

dainty dancing of the ladies trained by Miss Elsie Chapman was greatly appreciated. The play was well cast—Mr. Reg. Brockwell making a dignified Chinaman and Mr. Fred. Bishop a highly diverting Ali Baba. Equally good, too, in their several ways, were:—Mr. Horace Kirby (Kasim Baba), Mr. Harold Hart (Baba Mastapha), Miss Lucy Sander (Zahrat-al-Kulub), Miss Mary Halsall (Alcolom), and Miss Nancy Batchen and Mr. William Partidge as the young lovers, Marjanah and Nur-al-Huda.

British Locomotives Ordered by Persia.—The Persian State Railways have placed an order with Beyer, Peacock & Co. Ltd. for five consolidation (2-8-0) type locomotives of an approximate total weight of 120 tons, including tender. Three of these are required for the Southern line running north from the Persian Gulf, and two for the Northern line from the Caspian Sea, both of which are being extended towards the capital, Teheran, as recorded in the article on "Railway Developments in Persia," published in our issue of October 13 last. This is the first order for locomotives to be placed by Persia in this country. Brief details of the new locomotives are given in our Contracts and Tenders column.

L.M.S. Captains' Social.—The twelfth annual Blue Water evening of the captains of the Goole Steam Shipping branch of the L.M.S.R. was held at the North Eastern Hotel, Goole, on March 13. Commander W. B. Clementson, R.D., R.N.R., Marine Superintendent of the Goole L.M.S. fleet, was in the chair. The guest of honour was Col. K. R. N. Spiers, Assistant (Continental) Chief Commercial Manager, L.M.S.R., who replied to the toast of "The Visitors." He was supported in a witty speech by Mr. E. G. Garstang, Steamship Manager (East Coast), L.M.S.R. An entertainment of musical and humorous items was given in the course of the evening, and community singing of sea shanties was led by Mr. C. R. Ingleby, who had organised the event.

Great Southern Railways Directorate.—The result of the postal ballot for directors of the Great Southern Railways Company was declared in Dublin on Monday evening, March 19. Under the Railways Act of 1933 the number of directors was reduced to seven, and their election was required to be by postal ballot. The elected candidates with the number of votes cast are:—Rt. Hon. James MacMahon, P.C., 17,646; Sir Walter R. Nugent, Bt., 16,132; Mr. William Lombard Murphy, 14,876; Mr. James Perry Goodbody, 14,406; Mr. Joseph Xavier Murphy, 13,722; Major Hugh Arthur Henry, 1,748; Mr. Christopher Douglas Evans, 11,646. Of the nine directors who sought re-election seven were successful, but Lt.-Col. T. A. E. Cairnes, with 11,528 votes, and Mr. Patrick J. Brady, with 11,333 votes, were defeated, as was also a new candi-

date, Mr. Charles Joseph Reddy, who secured only 3,850 votes. Only about 38 per cent. of the ballot papers issued by the returning officer were used by shareholders.

Goods Vehicle Licences.—A reminder has been issued by the Ministry of Transport that all persons who used motor goods vehicles as paid carriers between April 1, 1932, and March 31, 1933, must apply to the appropriate Traffic Area licensing authority, not later than April 1 next, if they wish to avail themselves of their statutory right, under the Road and Rail Traffic Act, 1933, to licences for "claimed" tonnage. The licensing authority will have full power in his discretion to grant or refuse, wholly or in part, applications for A (public carrier) or B (limited carrier) licences made after that date.

Crewe Pupils and Premiums.—The 44th annual dinner of past and present Crewe pupils and premiums will be held at the Trocadero Restaurant, Piccadilly, W.1, at 8 p.m. on Friday, May 4. The chair will be occupied by Captain H. P. M. Beames, Deputy Chief Mechanical Engineer, L.M.S.R., and the guest of honour will be the Right Hon. J. H. Thomas, P.C., M.P., Secretary of State for Dominion Affairs. Past and present Crewe pupils and premiums are requested to communicate with Mr. Reginald Terrell, Honorary Secretary, 17-19, Cockspur Street, S.W.1, if they fail to receive a notice of the dinner.

A Record Run on the Great Southern Railways, Ireland.—On March 20, the Great Southern Railways provided a special train to convey Mr. W. W. McDowell, the new United States Minister to the Irish Free State, from Cobh (Queenstown) to Dublin. The train consisted of three bogie coaches. Limitation of axle loads necessitated the use of a light locomotive as far as Cork, where No. 402, two-cylinder 4-6-0 type, was substituted, engine-changing being accomplished in three minutes.

The following is a log of the run thence to Dublin:—

Miles.	Hr.	Min.
0 Cork	0	0
21 Mallow	0	24
58½ Limerick Jn.	1	0
79 Thurles	1	16
98½ Ballybrophy	1	33
114 Maryboro'	1	44
123 Portllington	1	52
135 Kildare	2	02
165 Kingsbridge	2	27

The 165½ miles were thus covered in 147 min., or at an average start-to-stop speed of 67½ m.p.h., the overall time record being lowered by eight minutes. The previous best running, made by the Irish Convention Special in 1917, was over the 165 miles between Cork and Island Bridge cabin, the time being 155 minutes, but as the load was then somewhat heavier and a stop was made at Thurles for water, there was probably little to choose between the two locomotive performances. This last run is the first in which a train on the G.S.R.

has covered 165½ miles without an intermediate stop.

Carter Paterson & Co.—In the Chancery Division on Monday, March 19, Mr. Justice Eve confirmed an alteration in the form of the constitution of Carter Paterson & Co. by substituting a memorandum and articles of association for the company's deed of settlement. It was explained that all the shares in the company were now held by the four main line railway companies. The memorandum of association would extend the objects of the company to enable it to carry on the businesses of haulage contractors, general agents, agents for the sale of motor vehicles, builders and repairers of such vehicles, and any other business which could be conveniently carried on in connection therewith.

Memorial Service for Lord Faringdon.—A memorial service for the late Lord Faringdon was held on Wednesday, March 21, at St. James's Church, Piccadilly, the Rev. A. Linzee Giles officiating. Members of the family were present, and amongst others who attended were the Argentine Ambassador, the Danish Minister, Sir Sam Fay, and Sir Stephen Killik.

The London & North Eastern Railway Company was represented by the following:—Mr. William Whitelaw, Chairman; Mr. H. T. Bailey, Sir Charles Coupar Barrie, Sir Charles Batho, the Hon. Rupert Beckett, Mr. Oliver Bury, Major Carver, M.P., Mr. W. B. Gair, Mr. A. K. McCosh, Sir John Noble, Mr. F. L. Steel, and Sir Murrugh Wilson, Directors; Sir Ralph Wedgwood, Chief General Manager; Messrs. A. J. Brickwell, Estate and Rating Surveyor, Southern Area; C. J. Brown, Engineer, Southern Area; C. Carslake, Assistant Signal Engineer, Southern Area; H. R. Cripps, representing the Chief Legal Adviser; F. Downes, Signal and Telegraph Engineer, Southern Area; P. J. Dowsett, Assistant Secretary; H. N. Gresley, Chief Mechanical Engineer; H. H. Mauldin, Superintendent, Eastern Section, Southern Area; J. E. Ryan, Hotels Superintendent, Southern Area; G. F. Thurston, Divisional General Manager, Southern Area. The London Midland & Scottish Railway Company was represented by Sir Josiah Stamp, Chairman, and Major Sir Ralph Glynn, Director. The Cheshire Lines Committee was represented by Messrs. C. Leadam, Acting Manager, and K. C. Marrian, Resident Engineer. Argentine railway companies were represented by Mr. Henry C. Allen, Sir Eastman Bell, Lt.-Col. R. Tristram Harper, Mr. G. H. Harrison, Mr. W. Howard Williams, Mr. Ronald Leslie, and Lt.-Col. Woodbine Parish.

L.P.T.B. and Workmen's Fares.—A deputation from the London Trades Council was recently received by the London Passenger Transport Board when questions about workmen's fares were discussed. At the close of the conference a statement was issued by the board to the effect (1) that the substitution of trolley buses for tramways would not prejudice any existing workmen's fare facilities, (2) that the board had no intention of withdrawing cheap travel facilities, and would contemplate such a course only if its revenues were inadequate to meet its obligations under the London Passenger Transport Act. In that event the action taken would be deliberate on a review of all the facts and open so that the conduct of the board would be justified. At present no such action was under consideration.

(3) That the board was considering the unification of conditions as to the issue of cheap tickets upon some reasonable basis, and were also considering simplification in the issue of tickets now that the several undertakings were unified under one control.

Turkish Government takes over Smyrna-Cassaba Railway.—Reuters Trade Service reports from Ankara that the Turkish Government has rather surprisingly decided to take under State control the 750-km. railway from Pandirna, on the S.a of Marmora, to Afion-Kara-Hissar via Izmir, which was leased to a French company in 1893. The rapid increase in motor omnibus traffic on parallel roads has sharply reduced the profit-earning capacity of the railway in recent years. The concession was for 99 years, but the Government had the right to buy the railway back after 30 years. Negotiations for the valuation of fixed and rolling stock are to begin at Ankara without delay. The superintendence of the running of the line has already been taken over by the Turkish authorities. Serving the north-west corner of Asia

Minor, this standard-gauge railway is based on Izmir (formerly Smyrna). The original concession was granted in 1863, a small section of line opened in July, 1865, and Cassaba reached in the following year. It was extended to Ala Shehr in 1873, and subsequently to Afion-Kara-Hissar, where it joins the Turkish State Railway (Anatolian line). An important branch from Manissa was opened as far as Soma in May, 1890, and eventually reached the Sea of Marmora at Pandirna. The traffic is mainly agricultural.

East Kent Light Railway.—Mr. Justice Clauson has granted a petition by the directors of the East Kent Light Railways Company for confirmation of a scheme of arrangement with the company's debenture stockholders. It was explained that the company had become overcapitalised and that it was proposed now to devote the whole of the revenue for the next five years to paying the debenture interest, at the end of which period any interest that could not be paid would be cancelled. In the meantime there would be no fresh issue of shares.

British and Irish Railway Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices	
			Mar. 21 1934	Rise/Fall
G.W.R.				
Cons. Ord. ...	551 ²	31	591 ²	-1 ²
5% Con. Prefce. ...	109 ⁵ ₄	691 ²	1111 ²	-2
5% Red. Pref. (1950) ...	1091 ⁴	871 ²	1101 ²	-1
4% Deb. ...	1081 ⁵ ₁₆	991 ⁴	1071 ²	-1 ²
4½% Deb. ...	108	1003 ⁴	1101 ²	—
4½% Deb. ...	116	106	1171 ²	—
5% Deb. ...	128	1171 ⁴	1281 ²	—
2½% Deb. ...	65	60	671 ²	—
5% Rt. Charge ...	124	1111 ²	1261 ²	-1
5% Cons. Guar. ...	122	103	1231 ²	-2

L.M.S.R.				
Ord. ...	297 ⁸	121 ⁸	271 ²	-1 ²
4% Prefce. (1923) ...	51	17	581 ²	-1 ²
4% Prefce. ...	72	331 ⁴	81	—
5% Red. Pref. (1955) ...	93	471 ⁴	99	-21 ²
4% Deb. ...	1031 ⁴	891 ²	1031 ²	-11 ²
5% Red. Deb. (1952) ...	114	105	1131 ²	—
4% Guar. ...	971 ⁴	68 ⁸	100	—

L.N.E.R.				
5% Pref. Ord. ...	221 ²	73 ⁴	211 ⁴	—
Def. Ord. ...	103 ⁴	41 ⁸	101 ²	—
4% First Prefce. ...	651 ²	193 ⁸	69	-11 ²
4% Second Prefce. ...	401 ²	121 ⁴	411 ²	-1
5% Red. Pref. (1955) ...	83 ⁴	27	891 ²	-21 ²
4% First Guar. ...	943 ⁴	581 ⁴	961 ²	—
4% Second Guar. ...	891 ⁴	48	911 ²	-2
3% Deb. ...	77	601 ⁴	79	-11 ²
4% Deb. ...	023 ⁴	80	103	-11 ²
5% Red. Deb. (1947) ...	112	1021 ²	1101 ²	-1
4½% Sinking Fund Red. Deb.	1071 ²	983 ⁴	1061 ²	—

SOUTHERN				
Pref. Ord. ...	71	273 ⁴	81	-1
Def. Ord. ...	243 ⁸	93 ⁸	781 ²	—
5% Prefce. ...	1071 ¹ ₁₆	74	1111 ²	-2
5% Red. Pref. (1964) ...	1073 ⁴	787 ⁸	1111 ²	-11 ²
5% Guar. Prefce. ...	1241 ⁴	1023 ⁴	1241 ²	-1
5% Red. Guar. Pref. (1957) ...	1153 ⁸	1031 ²	1141 ²	-1
4% Deb. ...	1071 ²	963 ⁴	1051 ²	-11 ²
5% Deb. ...	1261 ²	1141 ⁴	1261 ²	-1
4% Red. Deb. 1962-67	1071 ⁴	100	1061 ²	—

BELFAST & C.D.				
Ord. ...	6	4	5	—

FORTH BRIDGE				
4% Deb. ...	991 ²	951 ²	1001 ²	—
4% Guar. ...	981 ²	94	1001 ²	—

G. NORTHERN (IRELAND)				
Ord. ...	71 ²	31 ²	5	—

G. SOUTHERN (IRELAND)				
Ord. ...	28	16	241 ²	—
Prefce. ...	24	121 ⁸	19	-1
Guar. ...	42	163 ⁴	441 ⁸	-1 ⁸
Deb. ...	60	307 ⁸	62	—

L.P.T.B.				
4½% "A" ...	1177 ⁸	112	1181 ²	—
5% "A" ...	1271 ⁴	1191 ⁴	127	—
4½% "T.F.A." ...	1111 ⁴	106	1091 ²	—
5% "B" ...	1221 ²	114	1201 ²	-1
5% "C" ...	863 ⁴	741 ²	771 ²	-1 ²

MERSEY				
Ord. ...	161 ⁴	5	13	—
4% Perp. Deb. ...	83	637 ⁸	861 ²	—
3% Perp. Deb. ...	62	51	651 ²	—
3% Perp. Prefce. ...	503 ⁸	27	501 ²	—

British and Irish Railway Traffic Returns

GREAT BRITAIN	Totals for 11th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,941½ mls.)						
Passenger-train traffic ...	373,000	379,000	- 6,000	3,988,000	3,922,000	+ 66,000
Merchandise, &c. ...	468,000	436,000	+ 32,000	4,868,000	4,297,000	+ 571,000
Coal and coke ...	268,000	236,000	+ 32,000	3,065,000	2,922,000	+ 143,000
Goods-train traffic ...	736,000	672,000	+ 64,000	7,873,000	7,219,000	+ 654,000
Total receipts ...	1,109,000	1,051,000	+ 58,000	11,861,000	11,141,000	+ 720,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic ...	249,000	249,000	—	2,617,000	2,607,000	+ 10,000
Merchandise, &c. ...	333,000	310,000	+ 23,000	3,499,000	2,969,000	+ 530,000
Coal and coke ...	261,000	235,000	+ 26,000	2,785,000	2,584,000	+ 201,000
Goods-train traffic ...	594,000	545,000	+ 49,000	6,284,000	5,553,000	+ 731,000
Total receipts ...	843,000	794,000	+ 49,000	8,901,000	8,160,000	+ 741,000
G.W.R. (3,750 mls.)						
Passenger-train traffic ...	155,000	151,000	+ 4,000	1,671,000	1,671,000	—
Merchandise, &c. ...	183,000	174,000	+ 9,000	1,933,000	1,705,000	+ 228,000
Coal and coke ...	109,000	110,000	- 1,000	1,237,000	1,208,000	+ 29,000
Goods-train traffic ...	292,000	284,000	+ 8,000	3,170,000	2,913,000	+ 257,000
Total receipts ...	447,000	435,000	+ 12,000	4,841,000	4,584,000	+ 257,000
S.R. (2,177 mls.)						
Passenger-train traffic ...	234,000	230,000	+ 4,000	2,527,000	2,473,000	+ 54,000
Merchandise, &c. ...	54,000	62,000	- 8,000	658,500	607,000	+ 51,500
Coal and coke ...	38,000	33,000	+ 5,000	412,500	394,000	+ 18,500
Goods-train traffic ...	102,000	95,000	+ 7,000	1,071,000	1,001,000	+ 70,000
Total receipts ...	336,000	325,000	+ 11,000	3,598,000	3,474,000	+ 124,000
Liverpool Overhead (6½ mls.)	1,041	1,002	+ 39	11,882	11,307	+ 575
Mersey (4½ mls.)	4,075	4,025	+ 50	46,012	43,423	+ 2,589
*London Passenger Transport Board	515,600	—	—	18,418,200	—	—
IRELAND						
Belfast & C.D. (80 mls.)	1,635	1,753	- 118	19,025	18,738	+ 287
" " goods	573	607	- 34	5,870	5,613	+ 257
" " total	2,208	2,360	- 152	24,895	24,351	+ 544
Great Northern (562 mls.)	6,100	1,050	+ 5,050	76,700	40,900	+ 35,800
" " goods	8,900	700	+ 8,200	89,400	40,350	+ 49,050
" " total	15,000	1,750	+ 13,250	166,100	81,250	+ 84,850
Great Southern (2,158 mls.)	17,882	18,978	- 1,096	198,392	195,052	+ 3,340
" " goods	33,544	34,111	- 567	347,805	327,808	+ 19,997
" " total	51,426	53,089	- 1,663	546,197	522,860	+ 23,337

* 37th Week

* ex-dividend.

CONTRACTS AND TENDERS

BRITISH LOCOMOTIVES ORDERED BY PERSIA

The Persian State Railways Administration has placed an order with Beyer, Peacock & Co. Ltd. for five Consolidation (2-8-0) type locomotives, each of an approximate total weight of 120 tons, including tender. Three of these are required for the Southern line running north from the Persian Gulf, and two for the Northern line from the Caspian Sea, both of which are being extended towards the capital, Teheran. This is the first order for locomotives to be placed by Persia in this country. The new locomotives will be of the two-cylinder superheated type, and will be thoroughly up to date in every respect. They are to be equipped for coal and oil firing. The tractive effort at 85 per cent. will be 32,230 lb. It is understood that the Persian Government has received technical assistance from a representative of the Great Western Railway, who recently visited Persia in an advisory capacity.

The Persian State Railways Administration is also understood to have placed orders for 100 wagons with S.A. Metalurgique, Nivelles, and 30 wagons with L'Industrie Louvain, Belgium, and 60 wagons with a Swedish firm.

The Belgian National Railways Company, states a Brussels message, has recently placed orders for 11 diesel-engined railcars. This will bring up to 29 the total of such units in Belgium. Ten of the new railcars, which will seat between 60 and 104 passengers, it is indicated, are intended for short main-line and branch-line working, while a larger, 410-h.p. unit, is to serve on long-distance routes.

We understand that the Belgian National Railways Administration has placed an order for one Sentinel-Cammell steam railcar.

D. Wickham & Co. Ltd. has secured an order from the Entre Rios Railways for one petrol-driven works car chassis for logging service.

Nasmyth Wilson & Co. Ltd. has secured orders from the Mysore State Railways for two copper fireboxes for 4-8-0 locomotives, and one for 4-6-0 type locomotive.

The Hunslet Engine Co. Ltd. has secured an order from the Mysore State Railways for two copper fireboxes for 4-6-0 type locomotives.

The orders for new locomotives planned by the German State Railway will be mainly for small types, learns Reuters Trade Service. The German State Railway, which has only about 320 of these locomotives at present, intends to increase its stock to 900 and will probably award the necessary contracts in the course of this year. The orders will be divided into two groups,

namely, for small engines of 50 to 75 h.p. and 25 to 30 h.p.

Robert Stephenson & Co. Ltd. has secured an order for seven FTS class boilers for broad gauge tank locomotives for the Bengal-Nagpur Railway.

The Metropolitan-Cammell Carriage Wagon & Finance Co. Ltd. has received an order from the London Passenger Transport Board for 26 steel motor coaches to be fitted with General Electric Company's electrical gear, for service on the Piccadilly line. These coaches are similar to 145 supplied by the Metropolitan-Cammell Carriage Wagon & Finance Co. Ltd. for the same railway, and described in THE RAILWAY GAZETTE for May 13, 1932.

The Chinese Government Purchasing Commission has just placed the following orders on behalf of the Chinese Ministry of Railways:—

Dorman Long & Co. Ltd.: 7,730 metric tons 43 kg. steel rails and 540 metric tons fishplates; 120 metric tons 60 lb. rails and fishplates.

Barrow Haematite Steel Co. Ltd.: 3,635 metric tons 43 kg. steel rails and 330 metric tons fishplates.

Colvilles Limited: 2,690 metric tons 43 kg. steel rails and 194 metric tons fishplates.

Cargo Fleet Iron Co. Ltd.: 1,820 metric tons of 43 kg. steel rails.

Charles Richards & Co. Ltd.: 353 metric tons screwspikes.

The Anderson Foundry Company: 80,000 spring washers.

Walker & Wilson Limited: 48 metric tons fishbolts and nuts.

Thomas Summerson & Sons: Train ferry spares.

The East Indian Railway has recently placed orders with Imperial Chemical Industries (India) Limited for brass and copper round.

Alfred Herbert (India) Limited has received an order from the Indian Stores Department for two sets of diesel engine driven portable air compressors with spares, price Rs. 26,674 free delivery N.W. Railway Stores Depot, Karachi.

The Indian Stores Department, New Delhi, has placed contracts for the supply of carbon brushes with Electro Mechanics Limited, Associated Electrical Industries (India) Limited, Greaves Cotton & Co. Ltd., The English Electric Co. Ltd., and The Precious Electric Company.

The Bombay, Baroda & Central India Railway has recently placed the following orders:—

Duncan Stratton & Co., agents for Attock Oil Co. Ltd.: 400 tons axle oil at total price of Rs. 88,791-11-11.

Texas Co. (India) Ltd.: 25 tons diesel cylinder oil at total price of Rs. 10,000.

C.C. Wakefield & Co. Ltd.: 50 tons Wakefield S.H.S. cylinder oil at total price of Rs. 17,000.

Kilick Nixon & Co.: 60 tons Silvertown Sigma cylinder oil at total price of Rs. 20,400.

The Burmah-Shell Oil Storage & Distributing Company of India Ltd.: 600 tons first-quality crude oil for diesel and crude oil engines, at total price of Rs. 28,500.

Thermic Steel Co. Ltd., through the managing agents, J. D. Jones & Co. Ltd., Calcutta, has secured a rate contract from the Indian Stores Department, New Delhi, for the period February 10, 1934, to October 31, 1934, for the supply of Blueskyn Loco. brand graphite

suitable for foundry work with brass or iron castings at Rs. 14-8 per cwt.

The Controller of Stores, Eastern Bengal Railway, Calcutta, has placed orders for 250,000 steel dogspikes for B.G. 90-lb. F.B.B.S. rails at Rs. 9-4-0 per cwt. f.o.r. Shalimar, and for 300,000 steel dogspikes for M.G. 60-lb. F.B.B.S. rails at Rs. 9-12-0 per cwt. f.o.r. Shalimar.

The Agent, North Western Railway of India, invites tenders, receivable by April 5, for the supply of enamelled panel plates with mouldings.

The Agent, North Western Railway of India, invites tenders receivable by April 16 for the supply of chilled cast iron wheels.

The Agent, Great Indian Peninsula Railway, Bombay, invites tenders receivable by April 11, for five four-wheeled 15 ton kerosene oil tank wagons for the 5-ft. 6-in. gauge.

The Agent, East Indian Railway, Calcutta, invites tenders receivable by April 4 for the supply of 60 sets of switches for 90-lb. F.F.R.B.S. chrome steel rails, complete with fittings and stock rails, and also for the supply of plywood and leather dust shields.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, receivable by April 9, for the supply of 7,600 solid drawn steel boiler tubes for the North Western Railway of India, and 13,514 smoke tubes and 150 superheater flue tubes for the East Indian Railway.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, invites tenders, receivable by April 3, for wheel sets, axles and tyres for new goods stock required for the G.I.P., E.I. and E.B. Railways, as follows:—

For G.I.P. Railway: 520 pairs disc wheels and axles and tyres, 550 axles, 400 tyres and 730 glut rings.

For E.B. Railway: 420 pairs disc wheels and axles and tyres.

For E.I. Railway: 1,000 pairs disc wheels and axles and tyres, 400 tyres, 440 glut rings, 500 axles.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, invites tenders receivable by April 23 for the following materials required by the East Indian Railway: 64,300 galvanised division plates, 40,000 ungalvanised recoil spring washers, 50,000 galvanised side buffer recoil spring parting plates, and 450 auxiliary rubber spring parting plates, galvanised malleable cast iron or steel. Tenders receivable by April 26 are also invited for materials for the East Indian Railway, on a running contract basis, as follows: 90,000 buffer springs, 3,300 drawbar springs for I.R.C.A. drawgear, and 28,000 I.R. drawbar springs.

The Baldwin Locomotive Co. reports that it has booked new business valued at \$2,340,000 in February, and that this is the largest month's orders since June, 1931.

OFFICIAL NOTICES

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of:—
GIBS AND COTTERS.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Co., Ltd., marked:—"Tender for Gibs and Cotteners," with the name of the firm tendering, must be left with the undersigned not later than 12 noon on Friday, April 6, 1934.

The Directors do not bind themselves to accept the lowest or any tender.

A charge, which will not be returned, will be made of 5s. for each copy of the Specification.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, Westminster, S.W.1.

A. MUIRHEAD,
Managing Director.

91, Petty France,
Westminster, S.W.1.
March 21, 1934.

THE Proprietor of British Patents Nos. 196,577 and 209,110, dated April 24, 1922, relating to Improvements in Locomotives, and Patent No. 209,111, dated April 24, 1922, relating to Improvements in Turbine Electric Locomotives, is desirous of entering into arrangements by way of a license or otherwise on reasonable terms for the purpose of exploiting the above Patents and ensuring their practical working in Great Britain. Inquiries to Mr. B. Singer, Chrysler Building, New York City, N.Y., U.S.A.

Efficiency of the Sentinel-Cammell Steam Railcar

(See illustration on page 498)

The following statement of costs incurred on a Sentinel-Cammell steam railcar on the Ferrocarril de Zafra a Huelva of Spain indicates the satis-

factory service provided by such vehicles. The costs cover a period from June, 1929, to January, 1934, and a mileage of 159,751 (257,096 km.), and

include overhaul expenses to enable the car to continue in service for a similar or greater mileage. The costs are given, as we received them, in Pesetas, and at the current rate of exchange, viz., 37½ Pesetas = £1, the total expenditure on the car for the whole of the above mentioned period and mileage, including all running costs and repairs, amounted only to approximately £3,700.

Periods in Service	Km. run	Expenditure while in Service									Periods out of Service	General Total spent on Coach			
		Staff	Coal	Oils	Water	Wages in		Materials	Total cost in Service	Cost per km.		Wages	Materials	Total	Pesetas.
		Pesetas.	Pesetas.	Pesetas.	Pesetas.	Washing	Maintenance	Pesetas.	Pesetas.			Pesetas.	Pesetas.	Pesetas.	Pesetas.
June, 1929—Nov., 1930	111,404 (69,223 miles)	19,481·7	19,652·5	4,045·4	965·5	2,720·1	1,882·4	2,315·8	51,063·5	0·46	Dec., 1930—Mar., 1931.	3,522·6	1,039·7	4,562·4	55,625·9
April, 1931—Nov., 1931	46,284 (28,759·5 mls.)	7,252·8	7,318·6	2,064·5	262·5	1,330·7	792·3	331·5	19,352·9	0·42	Dec., 1931—March, 1932.	4,337·9	1,172·1	5,510·0	24,862·9
April, 1932—Nov., 1932	48,070 (29,869·3 mls.)	8,200·5	8,428·8	1,905·8	274·5	1,504·8	130·9	374·8	20,820·0	0·43	Dec., 1932—March, 1933.	3,773·6	1,051·4	4,825·0	25,645·0
April, 1933—Dec., 1933	51,338 (31,890 miles)	8,772·8	9,663·8	2,005·9	289·5	1,536·5	138·6	1,561·0	23,968·2	0·47	Dec., 1933—Jan., 1934.	1,024·6	7,753·8	8,778·4	32,746·5
Totals	257,096 (159,751 miles)	43,707·8	45,063·7	10,021·6	1,792·0	7,092·1	2,944·2	4,583·1	115,204·6	0·44		12,658·7	11,017·0	23,675·8	138,880·3
Cost per km. run		0·170 A	0·175 B	0·038	0·007	0·027	0·011	0·017	0·448			0·049 E	0·042 F	0·092	0·540

A. Includes wages and travelling allowances for main and relief crews, consisting of driver, fireman and conductor. B. Spanish coal was used throughout. 657 tons were burned on the 159,751 miles run at an average consumption of 9·2 lb. per mile. C. During these periods the coach was withdrawn for service reasons, and the opportunity was taken to give it a general overhaul. D. Car withdrawn for attention to tyres and to fit new firebox and superheater. E. Includes wages of driver and fireman even though coach was out of service. F. Apart from the cost of new superheater and firebox (714,757 Pesetas) which were fitted after the completion of 157,829 miles, this expenditure is mainly due to painting and minor repairs. The old firebox can be reconditioned at the cost of approximately 500 Pesetas. 37½ Pesetas = £1 at the present rate of exchange.

Euston Hotel Improvements

Extensive alterations and improvements are being carried out by the L.M.S.R. at the Euston Hotel, including a new scheme of interior decoration. The work is in the hands of Mr. Oliver Hill, R.I.B.A., who was responsible for the imaginative treatment of the Midland Hotel, Morecambe, which was described and illustrated in our columns of July 14 last. With the exception of the smoking room, the whole of the ground floor of the Euston Hotel is being entirely remodelled, beginning with a new canopy porch and finishing with a new American bar. The reception hall and corridors are being panelled in Empire woods of varying tones of beige, introduced, it is stated, for the first time in this country, with turquoise blue as the predominant colour of the new rubber floor coverings. For the

dining room a very attractive decorative treatment of panelled walls, with concealed ceiling lighting and illuminated glass columns, is being used. In the lounge further use will be made of panelled walls in tones of maple, with a complete colour scheme in shades of soft browns and greens. The new American bar is a harmony of beige and blue, with a complete back-bar decoration of frosted blue glass and the artistic use of flood-lighting augmented by tubular lights. To complete the ground floor there will be a new reception and cashier's office, and cloakroom. In the bedrooms the work of installing running hot and cold water, radiators, and Post Office telephones will be completed by July. All the rooms are being redecorated and some will have private bathrooms adjoining.

INSTITUTION OF LOCOMOTIVE ENGINEERS VISIT TO FORD WORKS.—On Wednesday afternoon a party of nearly 100 members of the Institution of Locomotive Engineers made a tour of the Ford motor car, commercial vehicle and tractor works at Dagenham. The visitors were much impressed by the system of conveyors in use throughout the works by which the various components were taken from stage to stage, and also by the methods adopted to avoid large storage areas, and the compact layout of plant and the wide uninterrupted gangways facilitating quick access to all parts of the works. One of the three large 150 h.p. B.T.H.-Allen diesel-electric locomotives built for shunting purposes in the Ford works, and described in THE RAILWAY GAZETTE Diesel Traction Section for December 30, 1932, was noted at work.

Railway Share Market

The stock and share markets have maintained a fair amount of activity, notwithstanding the approach of the Easter holidays and the commencement this week of a new account of three-weeks' duration which is not usually popular with operators. Home railway stocks, which had fallen badly last week on pressure to sell induced by fears of demands of the unions for higher wages, showed a sharp recovery at the opening of this week's business.

Investors were led to the reflection that the management of the railway companies would not have been unmindful of the demands for higher wages which would probably ensue on any very big recovery in net revenue, and there was some pressure to buy back stock which had been hurriedly sold last account. There was also evidence of a "bear" account in

some home railway stocks, doubtless based on the view that holders would be scared into forced sales by rumours of big wage demands. Whatever may have been the underlying cause of the change of tone there was a sharp rise, ranging from one to three points, in most stocks in the market. London Midland & Scottish ordinary stock was perhaps the only exception, but here there was a big recovery in the company's first preference and the 1923 preference stocks. Southern preferred ordinary jumped two points, and the second preference stock of the L. & N.E.R. was strong. Great Western ordinary stock moved up sharply, and there was every indication that if the weather conditions improve during the ensuing week there would be a further appreciable advance in the market. The quantity of prior lien stocks now available for investors is very limited. There are not more than about half-a-dozen of the different debenture stocks to select from. The

highest yielding stock is the 4 per cent. debenture of the L.N.E.R., of which there is a moderate quantity on offer at a price to give a yield of £3 17s. 6d. per cent. A return of as much as £4 3s. 9d. per cent. can be obtained on the same company's first guaranteed stock, of which there is a line on offer, and about 5s. per cent. more can be obtained on the 5 per cent. preference stock of the Southern. Moderate amounts of Great Western 4 per cent. debentures and L.M.S. 4 per cent. debenture stocks are on offer at prices which give a yield of £3 14s. per cent. and £3 16s. 9d. per cent. respectively.

Foreign railway stocks did not display much activity, although there was a slightly harder tone in some directions in Argentine issues. Buenos Ayres Western were marked up two points. This company's 4 per cent. debenture stock is now obtainable to yield 5½ per cent., and nearly 7 per cent. is to be obtained from the Central Argentine 5 per cent. stock.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1933-34	Week Ending	Traffic for Week		No. of Week	Aggregate Traffic to Date			Shares or Stock	Prices				
			Total this year	Inc. or Dec. compared with 1933		Totals		Increase or Decrease		H ighest 1933	Lowest 1933	Mar. 21, 1934	Yield % (See p. 10)	
						This Year	Last Year							
South & Central America														
Antofagasta (Chili) & Bolivia	830	18.3.34	12,530	+ 4,090	11	139,440	99,470	+ 39,970	Ord. Stk.	26	115½	25	—	—
Argentine North Eastern ..	753	17.3.34	10,100	+ 2,010	37	374,910	401,700	- 26,800	—	141½	5	91½	8	—
Argentine Transandine ..	111	—	—	—	—	—	—	—	A. Deb.	55	40	50	3	—
Bolivar	170	Feb., 1934	6,400	- 1,200	8	12,950	15,200	- 2,250	6 p.c. Db.	10	5	10	—	—
Brazil	—	—	—	—	—	—	—	—	Bonds	15	11	13	3½	—
Buenos Ayres & Pacific ..	2,806	17.3.34	137,000	+ 8,000	37	3,851,000	3,968,000	- 114,000	Ord. Stk.	26	97½	13½	—	—
Buenos Ayres Central ..	190	11.3.34	6,233	+ 1,816	37	357,794	337,764	+ 20,030	Mt. Db.	30	10	25½	—	—
Buenos Ayres Gt. Southern	5,085	17.3.34	240,000	+ 3,000	37	7,437,000	7,426,000	+ 11,000	Ord. Stk.	44½	21½	30½	—	—
Buenos Ayres Western ..	1,926	17.3.34	75,000	+ 5,000	37	2,375,000	2,480,000	- 105,000	"	34½	15½	23½	—	—
Central Argentine ..	3,700	17.3.34	173,000	+ 2,000	37	6,095,000	6,801,000	- 706,000	"	28½	15	19½	—	—
Do.	—	—	—	—	—	—	—	—	Div.	18	10	13½	—	—
Cent. Uruguay of M. Video	273	17.3.34	15,271	- 106	37	607,162	564,919	+ 42,243	Ord. Stk.	20	8	15	—	—
Do. Eastern Extn. ..	311	17.3.34	4,079	+ 404	37	121,261	121,468	- 207	—	—	—	—	—	—
Do. Northern Extn. ..	185	17.3.34	2,037	+ 340	37	65,951	71,286	- 5,336	—	—	—	—	—	—
Do. Western Extn. ..	211	17.3.34	1,409	+ 153	37	60,726	51,260	+ 9,466	—	—	—	—	—	—
Cordoba Central	1,218	17.3.34	32,000	-	37	1,533,000	1,533,000	-	Ord. Inc.	9½	21½	5	—	—
Costa Rica	188	Nov., 1933	18,534	- 3,195	21	99,724	107,788	- 8,064	Stk.	29	20	26	—	—
Dorada	70	Feb., 1934	10,300	+ 4,500	8	22,010	13,610	+ 8,400	1 Mt. Db.	76½	68½	95	—	—
Entre Rios	810	17.3.34	12,300	- 1,100	37	580,700	571,300	+ 9,400	Ord. Stk.	26½	9	18½	—	—
Great Western of Brazil	1,082	17.3.34	8,500	+ 4,200	11	114,800	168,800	- 54,000	Ord. Sh.	23½	12	4	—	—
International of Cl. Amer.	794	Jan. 1934	\$460,733	+ \$30,823	4	\$460,733	\$429,910	+ \$30,823	—	—	—	—	—	—
Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	12	1½	1	—	—
La Guaira & Caracas ..	224	Feb., 1934	3,180	- 2,950	4	7,581	13,240	- 5,660	Stk.	16	10	12½	—	—
Leopoldina	1,918	17.3.34	26,069	- 1,134	11	251,842	281,522	- 29,680	Ord. Stk.	20½	10	11½	—	—
Mexican	483	14.3.34	\$230,800	+ \$37,300	10	\$2,207,200	\$1,854,300	+ \$352,900	Ord. Stk.	2	1	2	—	—
Midland of Uruguay ..	319	Feb., 1934	9,313	+ 1,790	34	77,993	67,947	+ 10,046	Ord. Stk.	78	6	11½	—	—
Nirate	411	15.3.34	11,776	+ 4,604	10	64,768	21,714	+ 43,054	Ord. Sh.	72	49½	2	—	—
Paraguay Central ..	274	10.3.34	2,920	+ 240	36	114,920	97,900	+ 17,020	Pr. Ll. Stk.	154	5	13	—	—
Peruvian Corporation ..	1,059	Feb., 1934	51,532	+ 7,094	34	439,952	440,559	- 607	Pref.	70	66½	81	—	—
Salvador	100	10.3.34	2,400	+ 3,242	37	47,366	101,183	- 53,817	Pr. Ll. Db.	70	66½	81	—	—
San Paulo	153½	11.3.34	30,393	- 7,836	10	288,649	308,034	- 19,385	Ord. Stk.	102	68	81	—	—
Taitai	164	Feb., 1934	7,015	- 5,675	34	46,215	28,215	+ 18,000	Ord. Sh.	184	5	111½	—	—
United of Havana ..	1,365	17.3.34	49,648	+ 5,697	37	608,416	653,154	- 44,738	Ord. Stk.	8	2	5	—	—
Uruguay Northern ..	73	Feb., 1934	1,086	- 70	34	9,391	12,630	- 3,239	Deb. Stk.	6	3½	5	—	—
Canada														
Canadian National ..	23,750	14.3.34	646,944	+ 163,837	10	5,879,997	4,802,219	+ 1,077,778	—	—	—	—	—	—
Canadian Northern ..	—	—	—	—	—	—	—	-4 p.c.	Perp. Dbs.	60½	38	68	—	—
Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99½	85	99½	—	—
Canadian Pacific ..	17,018	14.3.34	436,800	+ 34,600	10	4,400,000	3,753,600	+ 646,400	Ord. Stk.	22½	11	17	—	—
India														
Assam Bengal	1,329	17.2.34	30,510	+ 4,858	46	1,104,114	1,110,494	- 6,380	Ord. Stk.	79	70	76½	35½	—
Barsi Light	202	24.2.34	2,445	- 180	47	134,835	129,127	+ 5,708	Ord. Sh.	101½	70	99½	6	—
Bengal & North Western	2,113	24.2.34	52,575	+ 4,322	21	970,780	1,002,789	- 32,009	Ord. Stk.	127	240	271	5½	—
Bengal Doon & Extension	161	24.2.34	2,337	+ 265	47	138,863	136,971	+ 1,892	"	292	119	125	4	—
Bengal-Nagpur	3,269	17.2.34	129,825	+ 13,509	46	4,905,478	4,535,187	+ 370,291	"	97½	83½	99½	4	—
Bombay, Baroda & C. India	3,089	10.3.34	185,100	+ 13,575	49	7,474,350	7,192,875	+ 281,475	"	112	107	111½	5½	—
Madras & South'n Mahratta	3,230	24.2.34	130,830	+ 9,916	47	5,109,490	4,926,293	+ 183,197	"	127	114½	123½	4	—
Rohilkund & Kumaon ..	572	24.2.34	13,390	+ 1,890	21	200,502	190,818	+ 9,684	"	260	225	251	6	—
South India	2,526	17.2.34	78,207	- 3,999	46	3,573,657	3,647,497	- 73,840	"	119½	112	116½	6½	—
Various														
Beira-Umtali	204	Jan., 1934	45,442	+ 7,575	17	194,466	154,575	+ 39,891	—	—	—	—	—	—
Bilbao River & Cantabrian	15	Feb., 1934	1,696	+ 1,129	8	3,243	1,992	+ 1,251	—	—	—	—	—	—
Egyptian Delta	621	28.2.34	4,712	- 542	48	217,789	238,192	- 20,403	Prf. Sh.	151½	13½	2	—	—
Great Southern of Spain ..	134	10.3.34	2,324	+ 352	10	21,292	21,534	- 242	Inc. Deb.	4	3	5½	—	—
Kenya & Uganda ..	1,625	Aug., 1933	159,746	+ 12,456	35	1,523,550	1,273,216	+ 250,334	—	—	—	—	—	—
Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33½	44½	—	—
Mashonaland	913	Jan., 1934	82,678	+ 25,102	17	359,731	235,930	+ 123,801	1 Mg. Db.	91½	42	94½	—	—
Midland of W. Australia ..	277	31.1.34	15,353	+ 1,292	30	95,749	91,747	+ 4,002	Inc. Deb.	89	70	96½	—	—
Nigerian	1,903	3.2.34	46,124	+ 4,644	45	1,492,826	1,564,275	- 71,449	—	—	—	—	—	—
Rhodesia	1,538	Jan., 1934	148,792	+ 44,682	17	614,717	423,444	+ 191,273	4 p.c. Db.	98½	80½	100	—	—
South African	13,151	24.2.34	445,611	+ 53,534	48	21,383,015	18,577,099	+ 2,805,916	—	—	—	—	—	—
Victorian	6,172	Dec., 1933	731,550	- 113,258	25	4,307,656	4,520,111	- 212,455	—	—	—	—	—	—
Zafra & Huelva	112	Jan., 1934	12,909	+ 2,021	4	12,909	10,888	+ 2,021	—	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1%. * Traffic interrupted by earthquake.
† Receipts are calculated @ 1s. 6d. to the rupee. ‡ Average rate of exchange for the week:—This year 40½p. Last year 40½p.

Yield %
(See
Note)

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37₀
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83₁₆
NU
71₀
21₂
53₁₆
NU
NU

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560
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670

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514
448
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